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A STUDY OF THE IMPLICATIONS AND FEASIBILITY OF THE FULL APPLICATION OF TECHNOLOGICAL AIDS TO THE SOLUTION OF STAFF, SPACE, AND CURRICULUM PROBLEMS ASSOCIATED WITH A RAPIDLY GROWING URBAN UNIVERSITY. FINAL REPORT.

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THIS REPORT DESCRIBES THE PLANNING AND IMPLEMENTATION OF AN OFFICE OF INSTRUCTIONAL RESOURCES AT THE UNIVERSITY OF ILLINOIS, CHICAGO CIRCLE. THE OBJECTIVE WAS TO PROVIDE THE RAPIDLY GROWING URBAN UNIVERSITY WITH NECESSARY INSTRUCTIONAL RESOURCES AND MEDIA. DETAILS OF ORGANIZATION, STAFF, EQUIPMENT, SPACE, AND BUDGET ARE GIVEN. FACULTY COMMITTEES WERE APPOINTED IN 8 SUBJECT AREAS, TO IDENTIFY INSTRUCTIONAL PROBLEMS WITHIN EACH AREA AND DEVELOP SOLUTIONS. THE WORK OF THESE COMMITTEES IS REPORTED IN DETAIL. CONSULTANTS FROM OTHER INSTITUTIONS WERE EMPLOYED, AND COMMITTEES WERE GIVEN TIME AND FUNDS TO VISIT OTHER INSTITUTIONS FOR OBSERVATION AND DISCUSSION. FOUR OF THE EIGHT COMMITTEES IDENTIFIED INSTRUCTIONAL PROBLEMS AND INITIATED PROJECTS USING NEWER MEDIA TO SOLVE THEM. (MS)

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FINAL REPORT

Project No. B-439
Contract No. OE-4-16-008

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March 1967

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Charles J. McIntyre
and
John B. Haney

March 1967

The research reported herein was performed pursuant to a contract with the Office of Education, U. S. Department of Health, Education, and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

University of Illinois
Chicago, Illinois

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DEDICATION

The accomplishments herein reported would doubtlessly have been greater and more significant had it not been for the untimely deaths of two of our colleagues.

Professor John Dillinger was, variously, member and chairman of two of the early advisory committees whose recommendations led to the establishment of OIR; he was a part-time member of the administrative staff during its early months; and he chaired the Committee of the College of Business Administration which explored the implications of instructional technology for that college. He saw the Office of Instructional Resources as providing an important service to teaching and learning, and he contributed effectively to it during its formative period.

Professor Canio Radice was a wise and articulate critic - in the very best sense of the word - of the ideas, plans, and activities which led to the inception of the Office of Instructional Resources. He was a regular participant in the councils of the faculty advising the Office, and his was a major contribution. Concurrently, he chaired the Committee of the College of Arts and Architecture which studied the implications of new media for the college, and his thoughtful report of that Committee's work is included in the body of this report.

CHAPTER I

INTRODUCTION

A. The Problem

This is a report of the conception, evolution, and implementation of the Office of Instructional Resources at the University of Illinois, Chicago Circle campus. It is a report of a study and its implementation to provide a rapidly growing urban university with the resources and media for instruction that were deemed necessary in helping that institution meet the critical problems of staff, space, and budget. Because that institution's problems are typical in many respects of those which many other institutions are certain to face, this report and case study is offered as a possible source of guidance for others.

Much of the study was supported by a contract with the United States Office of Education. Funds from that contract were used partially to provide released time for faculty planning and involvement, for consultantships, and for faculty travel to relevant demonstrations of technological applications. On the other hand, planning for instructional resources at the University of Illinois, Chicago Circle, pre-dated the contract and was carried on at a much higher level of University support than was provided by the contract alone. It is clearly most useful to report the total effect and result, rather than attempting to isolate portions attributable to one or another source of monetary support.

In this report the term "instructional resources" refers to conceptions and personnel who will implement that which undergirds a psychological analysis of instructional requirements, to the measurement and research services which evaluate instructional procedures, to the instructional media and processes such as programed instruction, television, motion pictures, graphics, and other audio-visual aids, and to the physical settings of research and instruction. The term does not refer to the faculty or to the print-related aspects of the library which are freely acknowledged as the dominant "instructional resources" of any major institution of higher education. It is hoped and intended that this report will provide a point of view about the organization of instructional resources and provide some assistance in terms of philosophy, staff, space, facilities, and budget to others who may be planning a similar development.

B. Background

1. The National Context

So much has been written recently about changes in our society which are showing their reflection in the colleges and universities that to report them again in detail would be repetitious and tedious. Only those national trends will be noted here which have important implications for the conditions of instruction, with particular emphasis on those changes which are relevant to the development and use of instructional resources.

a. Student Population. Statistics published by the U.S. Office of Education (7) indicate that enrollments in institutions of higher learning will increase about 66 per cent from 1964 to 1973. In 1973, enrollments in institutions of higher education are expected to be about 7,950,000. This estimated increase may well prove to be conservative inasmuch as one can not predict the effect of such factors as Federal work-study programs; Federal programs at the lower levels to improve instruction, reduce drop-outs, and assist the underprivileged; and the increasing recognition by the general population of the need for a college education as essential preparation for satisfactory employment opportunities.

b. Availability of Faculty. The availability of faculty is, it would seem, the key to the situation. Accurate projections are extremely difficult to make, but the USOE has estimated the total demand for full-time equivalent staff in institutions of higher education at 704,000 in 1973-74 - an increase of about 50 per cent (7) over that required in 1964-65. These figures not only include teaching staff but staff for administration and organized research as well. For teaching staff alone the USOE estimated an increase in faculty needed at about 55 per cent. Thus, it is assumed that staff for organized research will grow more slowly than staff for teaching. A proportionately larger predicted increase of students over the predicted need for teaching faculty can be accounted for by an assumed increase in average student-staff ratio from 12.8 to 14.0.

During the same period (1964-65 - 1973-74), total new faculty required both for increased enrollment and for replacement is estimated at 556,000. About one out of every three faculty members employed in Illinois colleges and universities holds a doctorate. Thus, if Illinois may be taken as somewhat representative, it would appear that in the period 1964 - 1974 at least 185,000 Ph.D.s will have to be recruited to college teaching, administration, or research. At present, roughly 9,200 doctorates are granted each year, and of these 47 per cent enter college work. If the present rate of production of Ph.D.s going into teaching were to continue for the next ten years, 43,240 (or less than one-fourth of the number needed) would be available. Doubtless, the number of doctorates will increase and better salaries may attract a larger percentage into teaching. Even so, it is inconceivable that the educational qualifications of the faculty can be maintained. Therefore, it appears mandatory, if the quality of instruction is not to suffer or if qualified students are not to be denied access to a college education, that means be found to make more effective use of faculty resources.

c. Quality of Instruction. Automation, among other forces, is changing the character of skills needed by the work population. New jobs are being developed; old ones are being discarded; and the trend is clear - the unskilled and uneducated become the unproductive and unemployable. It is no longer sufficient to master a particular body of knowledge or a set of specific skills: in the rapidly changing conditions of modern society, it is often necessary for an individual constantly to master new knowledge and skills. Preparation for this new working world means, in most instances, preparation for a lifetime of learning.

Equally important is the citizen's education qua citizen. Here, too, the ancient verities and familiar relationships are in question and in flux. Within the nation, the social order is in upheaval. Across the world, empires have crumbled and the dispossessed have found their voice and are insistent that they be heard. If American democracy, based solidly upon an informed citizenry, is to survive, then the demands upon our citizens for study, reflection, flexibility, and understanding are enormous. The settled issues of today are very likely to become unstuck tomorrow and to require fresh study. Again, education is a preparation for lifetime learning.

Finally, the individual has his own private life for which he must find fulfillment, and this involves threading his way through the present confusion to some satisfactory philosophy of life, to a reasonable use of leisure time, to the cultivation and refinement of taste, and to a realization of one's self as a spouse, parent, friend, and individual.

In short, the fulfillment of the individual, the well-being of the nation, and a significant share in the shaping of the world seem to depend in large measure upon the trained intelligence of our youth. It is clear that there can be no diminution in the quality of the schools. Probably, indeed, quality of instruction must improve markedly, although the ratio of qualified staff to the number of students will grow increasingly unfavorable. The better utilization of faculty resources surely is one necessary factor in helping to resolve this dilemma.

d. Shortage of Funds. Much has been written recently in the press, journals, and popular magazines about the "taxpayers' revolt". It is sometimes said that the country is paying about as much as it can afford for education and therefore that more economical approaches to instruction must be developed. Some instructional media, notably instructional television, were originally urged upon educators as a move toward economy.

This point of view, however, is specifically rejected in this report. At the present time, our nation devotes only about four per cent of its gross national product to education in a time of unprecedented prosperity. Education is, or should be, a matter of first priority. We decline to hold forth any real solution to the higher cost of education which surely this country can and must afford. Moreover, the application of instructional resources to improve instruction and to make better utilization of staff is not an inexpensive affair. The savings that one might realistically hope to achieve with the full application of instructional technology would be in terms of increased efficiency in the use of staff and student time rather than in terms of an actual dollar savings in the cost of education.

e. Student Dissatisfaction. An important new dimension has entered education within the past year or two: forceful and sometimes decisive actions on the part of a student body to influence administrative and faculty decisions. This, also, appears to be part of the atmosphere of change. In the past, students attempted to influence administration and faculty by letters, by resolutions, and other forms of polite request. Today, students all too frequently influence the course of events at institutions of higher learning by strike, riot, and sit-in. Such behavior is not necessarily to be condoned, but it must be reckoned with. Up to the present time, most aggressive student actions have been directed toward issues other than ones concerned with curriculum, teaching procedures, and instructional organization. Nevertheless, there is an undercurrent of dissatisfaction among students with these as well and it may reasonably be predicted that this dissatisfaction will grow more intense as institutions become larger and more mechanized, and as the student may feel himself becoming more a statistic and less an individual. Therefore, it must be recognized that it probably will not be possible to apply instructional technology with consideration only of its instructional effectiveness, its efficiency,or its popularity with the faculty. Unless its application is thoroughly explained to the student and accepted by him as a genuine step toward improved instruction, he is very likely to react strongly and perhaps decisively against it.

2. Higher Education in Illinois (1)

Higher education in Illinois is presently carried on in 121 colleges and universities. Together these institutions enroll some 300,000 resident students, plus thousands of participants in extension courses and noncredit adult courses, workshops, and short-term institutes. Total enrollment in Illinois institutions of higher education is approximately equivalent to the total for Germany, and is greater than that of any other European country except the Soviet Union.

Recognizing the necessity for co-ordination and planning of higher education, in 1943 the Illinois General Assembly created the first of several study commissions for this purpose. Finally, in 1961, the General Assembly established a Board of Higher Education as a permanent co-ordinating and planning agency.

Following the specific requirements of the statute which established it, the Board prepared a "Master Plan" for Illinois higher education which is designed to point the direction to be taken up to 1975 and later.

Several findings and recommendations of the "Master Plan" are highly relevant to the present study:

a. Degree Credit Enrollment (Estimated). The number of students enrolled for degree credit in Illinois institutions of higher learning (both public and private) was 305,547 for 1965 and is estimated at 608,327 for 1975. This represents a percentage increase of 99 per cent.

Based upon experience and actual enrollment subsequent to the time these estimates were made, there is reason to suppose that they may be too conservative. Consequently, the figures below increase the projections by four per cent, and also provide a breakdown of the figures into projected enrollments for the six-county Chicago area and those for the rest of the state.

Enrollment

Year	Chicago Area	Outside Chicago	Total
1965 (Actual)	166,430	139,117	305,547
1970 (Projected)	316,708	291,619	608,327
1980 (Projected)	553,734	182,875	736,609

It will be noted that enrollment in the entire state will more than double during the period 1965 - 1980 and that the probable increase for the six counties comprising the Chicago area will be more than threefold.

b. Faculty Members Needed. It is estimated that 1,250 new faculty members will be needed each year until 1975 to meet expanding enrollments, with another 1,840 each year to replace those leaving positions. Some 37 per cent of all faculty members of Illinois institutions of higher learning hold doctoral degrees. If that percentage is to be maintained, Illinois would have to recruit one-fourth of all the doctorate holders in the United States who enter the teaching profession. The Board concluded that this would be "virtually impossible."

c. Maximizing Resources. The report states:

> "Unless some bold and imaginative steps are taken immediately, the quality of instruction in Illinois institutions will deteriorate rapidly. Given the number of people available in the field and those eligible to enter, it appears unlikely that the shortage of faculty can be met in sheer numbers. Other means must be found and used to make maximum use of the outstanding professors now on university and college staffs and to encourage the learning process in other than the traditional classroom situations.
>
> "Some of these means have been under experimentation for many years in this and other states. Closed- and open-circuit television, state-wide educational television networks, team teaching, credit by examination, and other techniques have proven successful in a wide variety of circumstances. Programed instruction has already passed its initial stages of development and other new means of speeding and perfecting the learning process are being considered. The great lag in the use of new techniques can be attributed primarily to the reluctance and apathy of both faculty members and administrators to change from traditional instructional methods. The lag in more extensive experimentation can be attributed to the lack of public funds. Little money has come from sources other than private foundations. If the state is to assure a quality education to an ever larger portion of its youth, it must devote greater attention and more of its resources to improvement of techniques for mass education."

3. University of Illinois

The University of Illinois, the land-grant institution of the State, was established in 1868 at Urbana, a community located in the east central portion of the state approximately 125 miles south of Chicago.

The main campus at Urbana enrolled 29,120 students in 1966, of whom 7,498 were graduate students. Thus, the Urbana campus of the University constitutes the largest institution in the State in enrollment of both graduate and undergraduate students.

The University also operates a Medical Center in Chicago with undergraduate and post-graduate programs in dentistry, medicine, nursing, and pharmacy. The enrollment in 1966 at the Medical Center was 2,496.

A third campus, the Chicago Undergraduate Division at Navy Pier in Chicago, evolved into the Chicago Circle campus and will be discussed more fully below. In 1966, the Chicago Circle campus had an enrollment of 10,921 students.

With a total on-campus enrollment of 42,537 the University of Illinois enrolled approximately 40 per cent of all students in public institutions in the State.

The three campuses are administered by a single Board of Trustees and a central administration located in Urbana and consisting of the President, Executive Vice President and Provost, Vice President and Comptroller, and their aides. Each of the Chicago campuses has a resident Chancellor and, with minor exceptions, all personnel below that level report directly or indirectly to their respective Chancellor. The three campuses have independent Faculty Senates (comprised of academic personnel with the rank of professor, with some of lesser rank serving on appointed Senate committees) which establish educational policy. There is co-ordination among the Senates by way of a co-ordinating committee and other liaison, but the programs and policies of the three campuses are not necessarily congruent.

If the University of Illinois continues to enroll its traditional proportional share of students in the state it will be necessary for the Urbana and Chicago campuses together to enroll 58,300 by 1970; 75,200 by 1975; and 84,200 by 1980. As mentioned previously, the greatest concentration of students will be in the Chicago area. Thus, if by 1970 the Urbana campus can accommodate about 32,000 students and the Chicago Circle campus about 21,300 (both probably maximum figures and not by any means certain of attainment) it may still be necessary to deny admission to a substantial number of qualified students.

In fact, both campuses are now generally limiting enrollment to students in the upper 25 per cent of their high school class, and thousands of qualified students are being turned away. No plans for University of Illinois expansion beyond 1970 have been announced.

The clear implication is that the University must avail itself of all possible means to make improved use of its resources so as to expand enrollment without deleterious effects upon the quality of instruction. It is also reasonably evident that the explosive growth situation facing the University of Illinois is similar to the situation facing many established or new educational institutions in the country.

4. The Chicago Circle Campus

Shortly after World War II, when it became evident that returning veterans would cause an unprecedented bulge in enrollments, the University of Illinois founded a Chicago Undergraduate Division on Navy Pier. The Chicago Undergraduate Division offered a limited curriculum through only the first two years of college. There were no terminal programs; students were expected to complete their degree requirements either at the Urbana campus or some other institution. The Division was supervised rather closely from Urbana in that not only were the general administrative officers in Urbana responsible also for their counterpart offices in Chicago, but the principal academic officers of colleges were associate deans, reporting to their respective deans in Urbana.

Navy Pier, the site of the Division, was probably unique in the annals of educational environment.[1] Its site was literally a pier jutting out five-eighths of a mile into Lake Michigan. Along the pier stretched makeshift classrooms, laboratories, lounges, cafeteria, locker space, offices, and so on, while outside ships from around the world were docking to load and unload cargo, and switch engines moved freight cars about. Obviously, the site was thought of as "temporary" and so it remained until February 1965, when the Chicago Circle campus was opened. During the final years of its occupancy, the Chicago Undergraduate Division enrolled approximately 5,000 students each semester.

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[1] An engaging description of academic life on Navy Pier may be found in A. Schiller, "Chicago's Oxford on the Rocks." (5)

Meanwhile, population figures pointed inexorably to the developing need for more college facilities in Illinois - and particularly in Chicago, where the population was growing at a much faster rate than in the rest of the state. The University made a number of ill-fated efforts to obtain land in Chicago on which a new campus could be developed. In general, the earlier efforts seemed to be frustrated by state and local political considerations, and perhaps basically because state and local officials in Illinois, as elsewhere, preferred either not to believe or to delay taking action on the clear predictions concerning the tidal wave of students sweeping toward the colleges. Finally, however, a location at "Chicago Circle", a deteriorating area where several expressways and high speed rail lines intersect, was donated by the city and was cleared with heavy reliance upon Federal funds.

In 1958, a committee composed primarily of personnel located in Urbana was charged with the responsibility of creating a ten-year building space estimate for the development of a general campus plan for Chicago Circle. The committee made its first definitive, but non-public, report in 1960. It is perhaps noteworthy that even with the existence of a nucleus organization in Chicago, it required seven years of extensive work between the commencement of planning and the opening of the resulting new institution.

The study and development of the new campus was predicated upon some of the following general assumptions which have remained essentially valid:

a. That the requirements in 1969 be developed for an anticipated enrollment of 20,000 students in a four-year curriculum which will also include considerable graduate work and faculty research.

b. That the building space requirements be determined by the educational program and be independent of any specific site.

c. That the teaching loads be normal (i.e. approximately the same as those at Urbana in the past).

d. That no staff appointments be made solely for research, but facilities for faculty research be provided.

e. That space estimates not be modified materially by television or other teaching methods.

f. That no provision be made for evening courses in addition to the regular daytime program requirements. (This may appear to be an unusual assumption to make with regard to an institution located in the midst of a major population center; however, at that time it appeared that evening programs of existing institutions would be adequate to handle the projected evening load. Time will tell whether this projection was accurate and if this assumption will remain valid).

g. That the graduate program in 1969 include work at the master's degree level in several departments and probably at the Ph.D. level in some departments. (Some 800 graduate students are included in the estimated 20,000 student enrollment of 1969.)

h. That only a few beds be provided for emergency use in the Health Center. First aid facilities, but no hospital facilities to be provided.

i. That no stadium be provided.

j. That auditorium facilities with a total seating capacity of 1,000 to 1,200 seats be provided initially. In developing the campus plan that the ultimate construction of a concert auditorium be anticipated.

k. That no student housing be provided in developing the campus plan for this commuting university.

l. That all library facilities be located in the Library Building.

As previously mentioned, the plan for the new campus assumed that "space estimates will not be modified materially by television or other teaching methods." Consequently, in the detailed campus planning that was going ahead rapidly in 1959 and 1960, no significant provision was made for television or other major new teaching resources other than some provision for film and overhead projection. From time to time, however, a faculty committee met to discuss how an allocation of 7,500 feet for broadcasting might be used. No conclusions emerged from these meetings.

Toward the end of the academic year 1960-61, the Vice President in charge of the Undergraduate Division and the Director of Instructional Television in Urbana[1] (later Director, Office of Instructional Resources, Urbana) began conversations, initially on the subject of instructional television on the new campus. Several facts quickly became apparent:

a. Provision should be made not only for television but also, at least, for film production; graphics production; distribution and servicing of projection equipment; programed instruction; and advisory service to the faculty on instructional procedures and innovations.

b. Too little space had been allocated for television alone and not nearly enough to accommodate the other resources.

c. The concept of instructional innovation through the use of new media would have to be introduced to the faculty.

d. Planning would have to go ahead rapidly in order to catch up with the remainder of the building program.

As a result of these conclusions, various actions were taken:

a. Planning was expanded to include for Phase I of construction[2] at least rudimentary provisions for the services needed in addition to television. For the first time, the term and concept "instructional resources" was introduced in the campus planning (July 1961).

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[1] An Office of Instructional Resources was created in Urbana in 1964 following the development of the concept at Chicago Circle. The functions of the two offices are quite similar.

[2] Construction at Chicago Circle has been scheduled in three major phases, Phase III to be completed by 1970. Phase I development is for an institution with 9,000 students; Phase II for an institution with 14,000 students; Phase III for an institution with 20,000 students.

b. All planned space for Phase I had already been allocated. Thus, where to locate "instructional resources" so that they would be convenient to faculty and students, and expandable during Phases II and III became a major problem. Finally, it was decided that the new office could be located on two floors of the library, adjacent to an area proposed for Phase II construction.[1] It was deemed especially appropriate that these non-book resources be located in and identified with the major non-human instructional resource of the institution, the library.

c. The first faculty meeting on the integration of new media in an instructional system was held July 9, 1962. Although the meeting was announced by a letter from the Vice President, it was poorly attended. At about the same time, a plan was developed and discussed with the U. S. Office of Education regarding involvement of the faculty in the use of technological aids to instruction. This was to eventuate in 1964 as the subject of this report.

d. The Director of Instructional Television in Urbana was designated as the responsible official to press forward with plans for the Office of Instructional Resources in Chicago. An advisory committee for the Office of Instructional Resources, consisting of knowledgeable faculty from both campuses, was appointed in October 1962.

C. Purpose

In all of the preliminary planning for the Office of Instructional Resources, the greatest need felt from the very beginning was for a plan and procedure to involve the faculty in planning for the significant instructional use of the service which the Office had to offer. Administrators could plan facilities and services, but only the teaching faculty could make significant educational use of them.

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[1] Readers will recognize the very high degree of co-operation and educational statesmanship on the part of the librarian who agreed to a reduction in conventional library space in order to accommodate this new service. The librarian in charge when initial arrangements were made was Mr. Edward Heiliger, now of Florida Atlantic University. He was succeeded in the same high spirit of co-operation by Mr. Frazer Poole.

As a consequence of this felt need, communication with personnel responsible for Title VII of the National Defense Education Act was begun in March of 1962 looking toward a study which, while of great use to this particular institution, would also yield generalizable methods and procedures for others contemplating the massive infusion of technological aids to instruction into either a new institution or an established one.

After considerable discussion and revision, a contract was negotiated for a study to cover the period March 30, 1964 - September 30, 1965. Subsequently, a no-cost extension of the contract was approved to permit the collection of more information on programs planned during the academic year of 1964-65 but not initiated until the Fall quarter of 1965 or later.

D. Objectives

1. To identify critical problem areas in university instruction to which the full application of instructional resources can make a significant contribution.

2. To propose and test forms of administrative and professional encouragement to the faculty to make use of these resources.

3. To identify needed changes in curricula and methods for their most effective use.

4. To plan for the proper administration and use of facilities and programs.

5. To plan facilities consistent with the projected requirements.

CHAPTER II

METHOD

A. Review, Revision, and Expansion of Existing Plans for the Office of Instructional Resources

This phase was conducted primarily through staff study with the assistance, review, criticism, and comment of knowledgeable consultants.

B. Faculty Committees

Small group faculty conferences were initiated at the departmental level to help identify critical problem areas and to explore the potential contribution of new media in solving them. Eight committees were formed, one in each of the following areas: German, engineering, mathematics, chemistry, English, biology, art and architecture, and business administration. One person from each committee was released one-third time during the academic year 1964-65 to serve as chairman of the committee and to provide systematic reports and observations of his group's activities. The committees and their chairmen were appointed by deans and department heads after consultation with the individuals involved.

These released-time chairmen were assigned the following specific responsibilities:

1. Serve as chairman of a department or college committee appointed to consider and recommend applications of new instructional resources to significant instructional problems.

2. Develop detailed recommendations with regard to significant applications of new instructional resources.

3. Develop detailed recommendations regarding curriculum changes associated with the use of new instructional resources.

4. Locate and secure (with the help of the Office of Instructional Resources) consultants who have had experience with the new media in the subjects under consideration for assistance in planning.

5. Locate (with the help of OIR) significant demonstrations of the use of new media in subjects under consideration at other comparable institutions. Visit and report.

6. Consider possibilities of inter- and intra- institutional co-operation in the development of materials and programs. Consider especially the possibility of co-operation with Urbana and the Medical Center.

7. Develop (with the assistance of consultants) plans for evaluating programs.

8. Study and comment on administrative arrangements which help or hinder the effective and convenient use of new instructional resources.

9. Study and comment on staff and facility arrangements which help or hinder the effective and convenient use of new instructional resources.

10. Submit full report (for inclusion in final report to the U.S. Office of Education) on proposals considered, decisions made, actions taken, and so on.

C. Inter-campus(Urbana - Chicago) Departmental Conferences

The intent of these conferences was to plan for the shared use of materials and resources. As will be seen in Chapter III, little of this in fact occurred.

D. Identification of Outstanding Uses of New Media

Outstanding examples of new media as applied to particular instructional problems were identified and relevant faculty members were provided the opportunity to study these examples at first hand. Faculty members were encouraged to visit institutions known to be making effective use of new media in order to observe, discuss, and evaluate these applications.

E. Identification and Solution of Problems in Administration - Faculty Relations

Problems in administration and faculty relations growing out of the use of the new media were identified and solutions to them were proposed. The problem of evaluating proposed programs was considered and specific plans in several instances made for such evaluation. Early in each group's discussions, the idea that their instructional methods and procedures should be evaluated was introduced. Consultants to assist in this evaluation were employed.

F. Project Evaluation

1. Inasmuch as a major objective of this study was to generate faculty action with regard to media, a record of such action contemplated and implemented constituted prime data. Anecdotal and subjective information about the reasons for and methods of reaching positive and negative decisions were available.

2. Both as a method of securing involvement and as a means to later evaluation, faculty groups devised means to evaluate the instructional plans which they had developed.

CHAPTER III

RESULTS

A. The Logistics of Instructional Resources

This chapter details the steps taken to realize the plans described in the previous overview. As far as possible, separate attention will be paid to the various aspects of setting up and operating the Office of Instructional Resources (OIR) - namely, organization and services, physical facilities, equipment, personnel, and budget.

1. Organization and Services

The Office of Instructional Resources is managed by a Director, who is responsible to the Chancellor of the University of Illinois for the Chicago Circle campus. The working units of the Office are divided into two functional groups: An Instructional Systems Group, and a Production and Services Group.

The Staff personnel in the Instructional Systems Group are drawn from persons with a background in educational psychology and college teaching. Their overall function is to design strategies and develop techniques for applying the psychology of learning to university instructional programs.

There are three working units in this group:

a. The Course Development Division works with members of an academic department to approach systematically a particular course, usually a large enrollment one. In this process, the members of the group and the faculty define the objectives of the course, analyze the structure of the discipline, devise instructional groupings and activities, select teaching methods and media, re-align personnel and material resources, and co-operate in the production of materials and evaluation instruments.
A statement by L. P. Greenhill, Director of Academic Research and Services at the Pennsylvania State University which further describes the process of "Course Development" may be found in Appendix A.

b. The Programed Instruction Division assists faculty members in writing programed instruction for academic courses, and in locating and using programed materials from outside sources.

c. The Learning Evaluation Division assists faculty members with test scoring, item analysis, data interpretation, test construction, and information about standarized subject-matter tests. (This Division has not yet been activated.)

The staff personnel in the Production and Services Group have a general concern with and background in higher education, but have,in addition, an expertise in a specific technical or artistic field. The overall function of this group is to insure that instructional strategies are carried out through well planned and executed media production and services. Their work is closely interrelated.

There are three working units in this group:

a. The Television Division produces and distributes television presentations and supports other uses of television in connection with departmental teaching activity. This division has a production department and an engineering-maintenance department.

b. The Audio-Visual Division provides direct assistance to individual faculty members in teaching their own courses as well as providing media support for departmentally developed courses. It likewise has two departments. The instructional materials department operates a library service for scheduling and rental arrangements, as well as providing information about sound motion pictures, filmstrips, slides, and audio materials. This department also operates a rapid-service "do-it-yourself" facility for making slides, overhead transparencies, and handouts. The technical services department records lectures and discussions on audio tape, duplicates audio tapes, and operates and maintains a wide variety of projection and sound equipment.

c. The Graphic Arts Division is responsible for establishing a high level of design throughout all areas of instruction and the University academic environment. It has three departments. The design department makes finished art work for television and projected media, and it designs faculty publications, instructional exhibits, and devices. The construction department builds television settings, models, devices, and exhibits. The photographic department provides a comprehensive photographic service to the campus, including still and motion picture photography, processing, and printing.

Further details about the services initially offered by OIR are found in Appendices B and C.

2. Physical Facilities

Each of the media and services included in the concept of instructional resources has a tradition in production and operation, and a decision to engage in any particular one means that a special physical facility must be designed and constructed for it. Such physical space is not interchangeable between media or services, as is the case with general purpose classrooms or offices. For example, the tradition in television is that production takes place in a studio, supported by a director's booth, master control center, and projection room. A decision to establish an instructional television service means that these basic facilities must be provided, whether as part of a modest service or an extensive one. As expansion takes place, not all physical facilities and space must expand in a linear manner. One master control room or projection room can support several studios, if it is originally built large enough to contain the required additional equipment. However, office space and conference rooms can be common to various media. Thus it was that both the preliminary planning and the actual construction of facilities for Phase I of the Office of Instructional Resources divided space into two areas: general purpose areas on the first floor of the Library Building; and specialized production and service facilities located in the basement. (See Figures 1 and 2 showing design, functional designation and floor areas for Phase I.) The space for OIR in the basement of the Library Building was placed so as to be adjacent to two sides of the building from which expansion could come in Phases II and III.

No significant changes in Phase II are indicated from Phase I with respect to the first floor, with the exception that the area reserved for a writing laboratory during Phase I will be taken over for an expansion of the reserve book facilities in Phase II by the Library. The plans for

Phase II, basement area, are found in Figure 3. Only new construction to the north of Phase I is shown.

Additional space in Phase III for OIR will result from new construction to the west of Phase I and II (See Figure 4). Phase III will see a consolidation of instructional materials, graphics, and photographic services in a "one-stop" faculty service. This area will have direct outside access on the north side of the Library Building, facing the faculty offices in University Hall. Also in the basement are planned an instructional laboratory and computer room, for it is believed that by the time of actual construction and equipment acquisition, computer-assisted instruction will have demonstrated its potential for individual programed instruction to the extent that a major operation will be both possible and desirable. While student stations might be located in other sections of the campus, a certain number will be located in the instructional laboratory for ease in developmental testing of programs.

One may also note in Figure 4 that the third television studio ("for future use" in Phase I plans) is to be converted into a multi-purpose studio, for audio recordings and motion picture photography as well as television. It is thought at the time of this writing that this arrangement will permit more flexible use of space, allowing audio recording of interviews, talks, musical events, and dramatic works to be made in an appropriate facility, with requisite quality stereo control console, while at the same time providing a lighting capability for both motion picture and television, since both use similar lighting instruments and controls. In all probability, the two existing television director's booths can be used for all three studios, for the crucial problem is rehearsal and set space. Also, because of the extensive use of videotape, live production facilities can be reduced.

Between the basement and first floor will be constructed a mezzanine on the west side of the Library Building. The television studios and workshop areas called for high ceilings in the Phase I and Phase II sections of the building. With the need for height reduced in the Phase III expansion section, an extra floor can be squeezed in. On this floor will be located the offices and work areas of the Instructional Systems Group, containing the space for research, consultation, and writing of programs and tests.

With the opening up of office space in the basement and on the mezzanine, a reduction will take place in OIR space on the first floor. Moving to the northwest corner, only the general administration and conference room functions will be retained. An outside access is also provided for this area.

A chart showing the relative growth of physical facilities in various phases is presented in Appendix D. It is summarized in Table A.

Table A

OIR Floor Areas in Three Phases of Campus Development

Function	Phase I (9,000 students)	Phase II (14,000 students)	Phase III (20,000 students)
Administration	1745 sq. ft.	1898 sq. ft.	2603 sq. ft.
Television	6105	7039	9259
Audio-Visual, Art, Photography	3316	5132	9658
Programed Instruction, Course Development, and Evaluation	1605	1605	6120
Total	12771	15674	27640

3. Equipment

The procedure used in planning for equipment that would be needed in the teaching program for Phase I of the Chicago Circle campus was to work from the architectural floor plans of the buildings to be constructed, and prepare "status sheets" listing room by room all of the fixed and moveable equipment required for operation. Thus for the OIR-designated areas of the Library Building, status sheets were prepared for the basement production and services area and for the first floor office and laboratory area. While the OIR planners were preparing

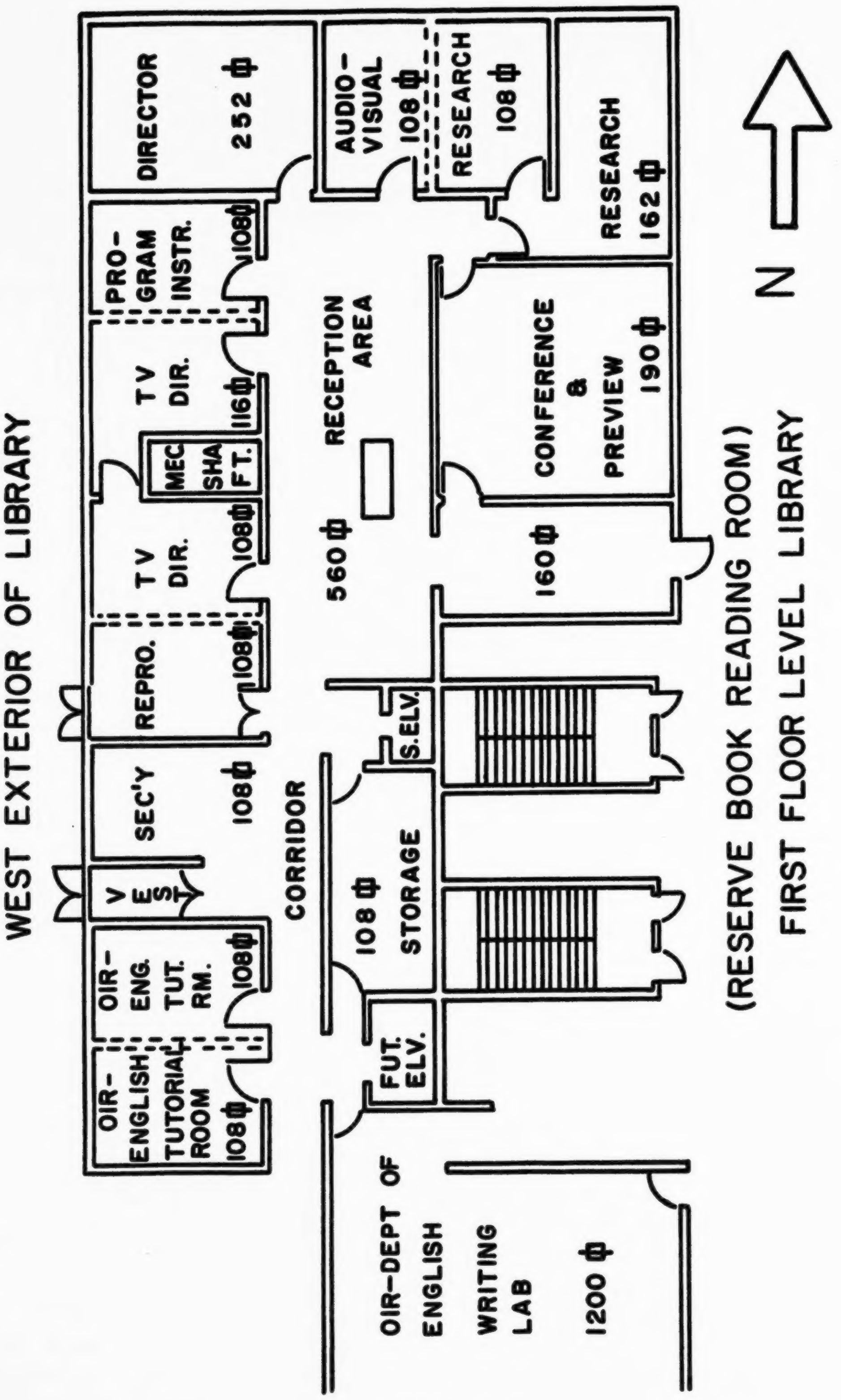
WEST EXTERIOR OF LIBRARY
DIRECTOR 252 ф
AUDIO-VISUAL 108 ф
RESEARCH 108 ф
RESEARCH 162 ф
PRO-GRAM INSTR. 108ф
TV DIR. 116ф
MEC SHAFT.
TV DIR. 108ф
REPRO. 108ф
SEC'Y 108ф
VEST
OIR-ENG. TUT. RM. 108ф
OIR-ENGLISH TUTORIAL ROOM 108ф
CORRIDOR
RECEPTION AREA
560 ф
CONFERENCE & PREVIEW 190 ф
160 ф
S.ELV.
108 ф STORAGE
FUT. ELV.
OIR-DEPT OF ENGLISH WRITING LAB 1200 ф
(RESERVE BOOK READING ROOM)
FIRST FLOOR LEVEL LIBRARY
N

FIGURE 1

OIR FIRST FLOOR AREA - FUNCTIONAL DESIGNATIONS (PHASE I)

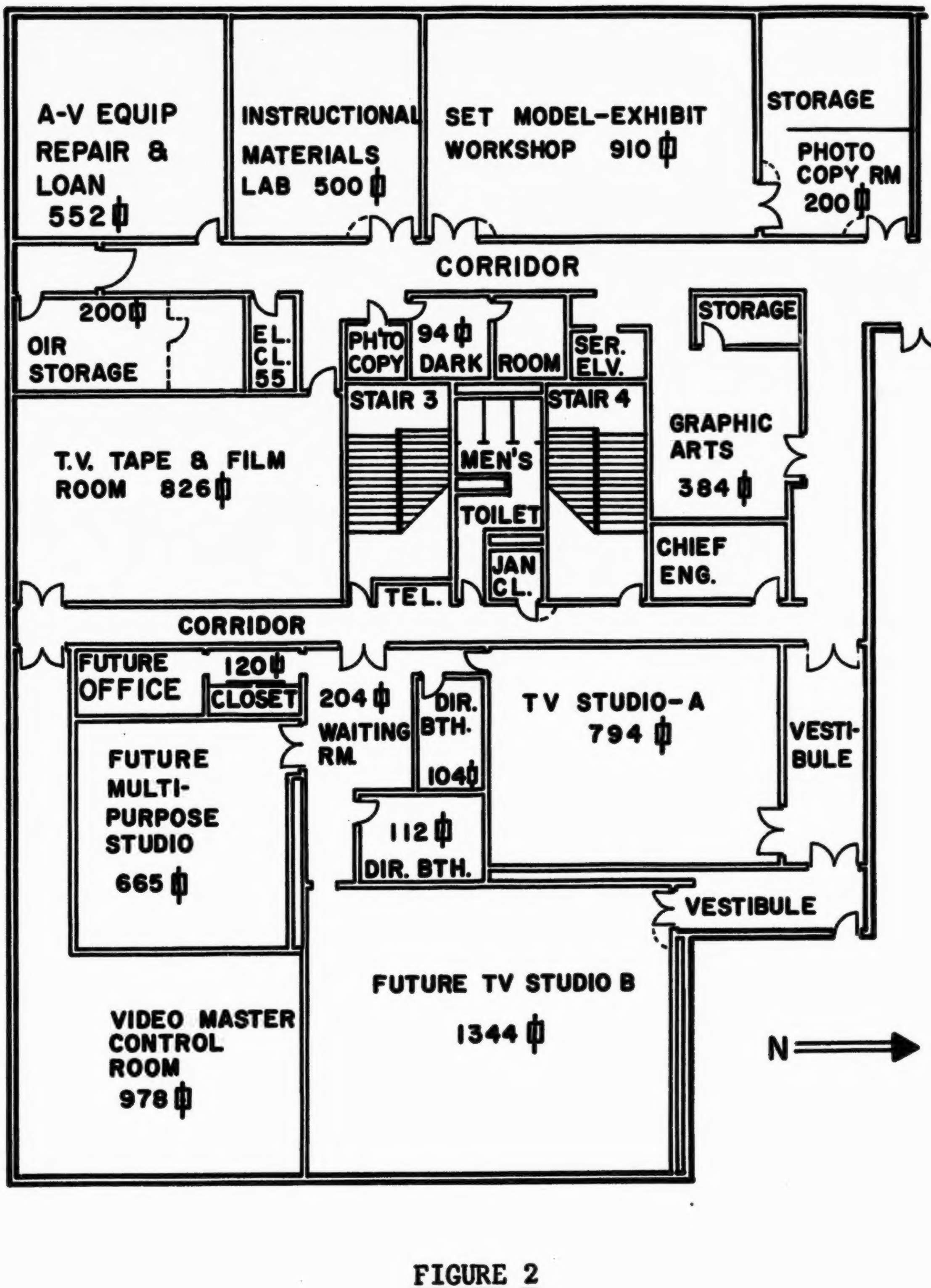
A-V EQUIP REPAIR & LOAN 552
INSTRUCTIONAL MATERIALS LAB 500
SET MODEL-EXHIBIT WORKSHOP 910
STORAGE
PHOTO COPY RM 200
CORRIDOR
200
OIR STORAGE
EL. CL. 55
PHTO COPY
94
DARK ROOM
SER. ELV.
STORAGE
STAIR 3
STAIR 4
GRAPHIC ARTS 384
T.V. TAPE & FILM ROOM 826
MEN'S TOILET
JAN CL.
CHIEF ENG.
TEL.
CORRIDOR
FUTURE OFFICE
120
CLOSET
204
WAITING RM.
DIR. BTH.
104
TV STUDIO-A 794
VESTIBULE
FUTURE MULTI-PURPOSE STUDIO 665
112
DIR. BTH.
VESTIBULE
FUTURE TV STUDIO B 1344
N
VIDEO MASTER CONTROL ROOM 978

FIGURE 2

OIR BASEMENT AREA - FUNCTIONAL DESIGNATIONS (PHASE I)

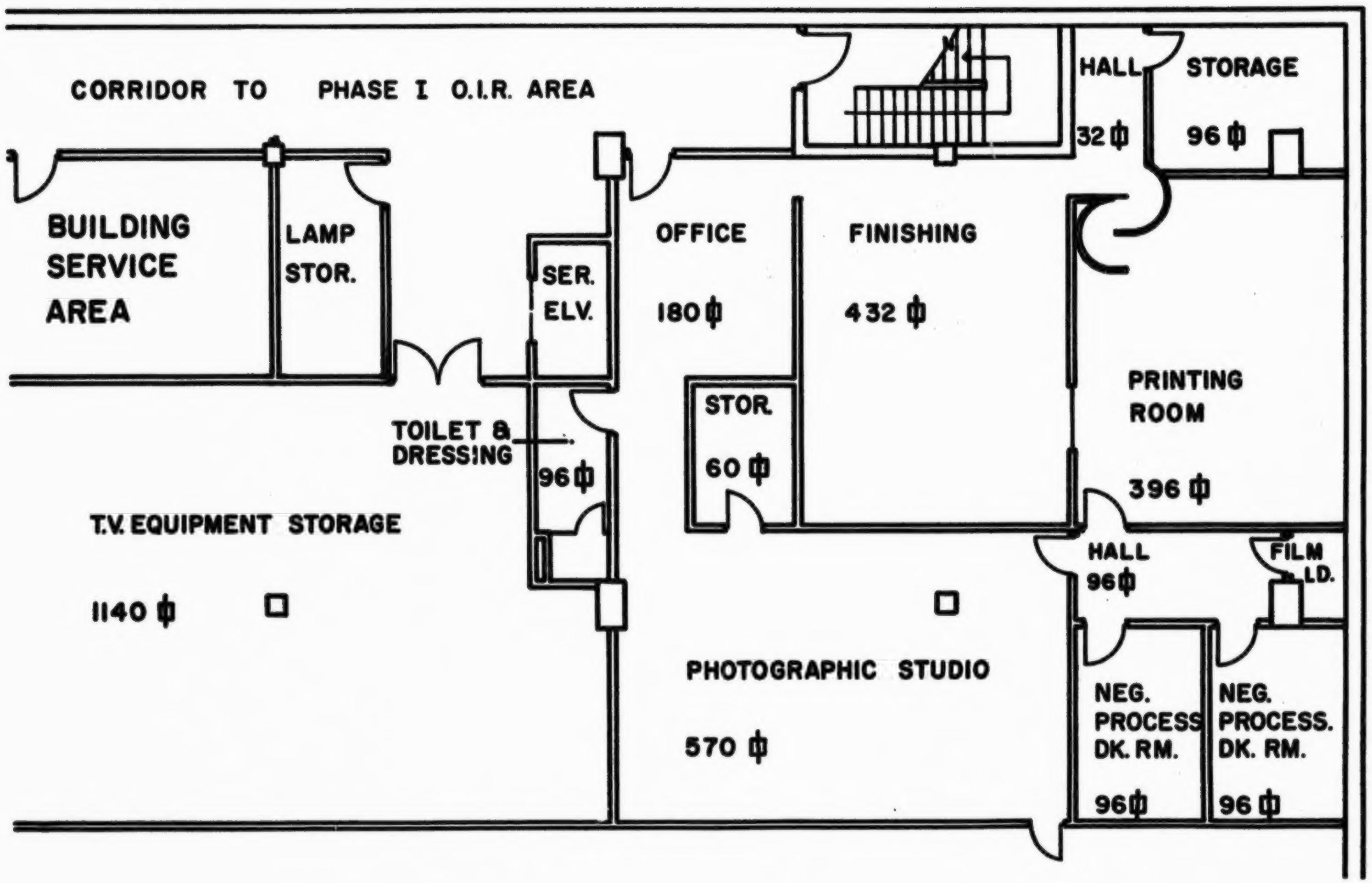
CORRIDOR TO PHASE I O.I.R. AREA
BUILDING SERVICE AREA
LAMP STOR.
SER. ELV.
OFFICE
180 ф
FINISHING
432 ф
HALL
32 ф
STORAGE
96 ф
PRINTING ROOM
396 ф
TOILET & DRESSING
96 ф
STOR.
60 ф
T.V. EQUIPMENT STORAGE
1140 ф
PHOTOGRAPHIC STUDIO
570 ф
HALL
96 ф
FILM LD.
NEG. PROCESS DK. RM.
96 ф
NEG. PROCESS. DK. RM.
96 ф

FIGURE 3

PHASE II ADDITION TO BASEMENT

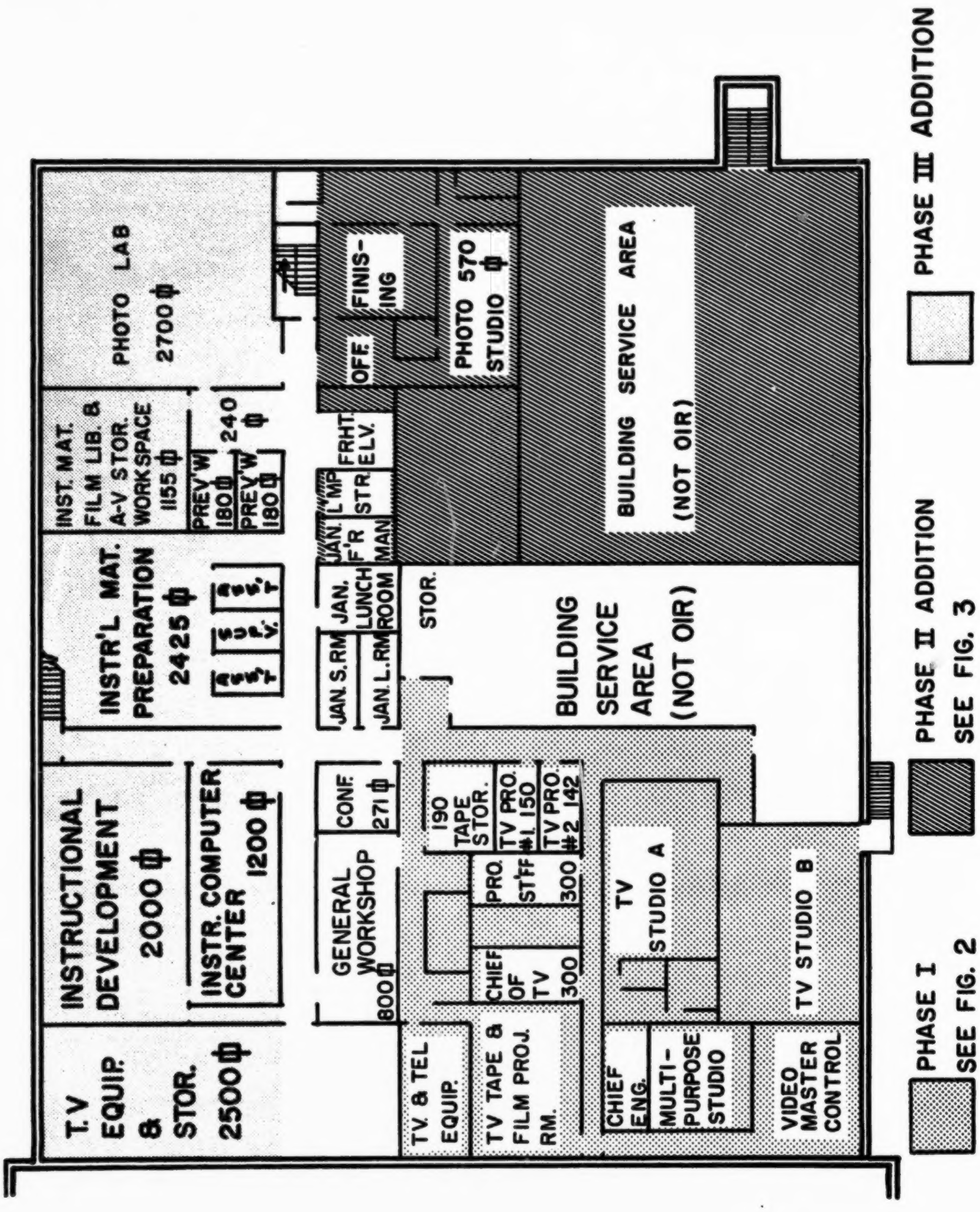
T.V EQUIP. & STOR. 2500
INSTRUCTIONAL DEVELOPMENT 2000
INSTR. COMPUTER CENTER 1200
INSTR'L. MAT. PREPARATION 2425
INST. MAT. FILM LIB. & A-V STOR. WORKSPACE 1155
PREV'W 180
PREV'W 180
240
PHOTO LAB 2700
TV & TEL EQUIP.
TV TAPE & FILM PROJ. RM.
GENERAL WORKSHOP 800
CONF. 271
CHIEF OF TV 300
PRO. ST'FF 300
190 TAPE STOR.
TV PRO. #1 150
TV PRO. #2 142
JAN. S. RM
JAN. L. RM
JAN. LUNCH ROOM
JAN. F'R MAN
L'MP STR
FRHT. ELV.
OFF.
FINIS-ING
PHOTO STUDIO 570
STOR.
BUILDING SERVICE AREA (NOT OIR)
BUILDING SERVICE AREA (NOT OIR)
CHIEF ENG.
MULTI-PURPOSE STUDIO
TV STUDIO A
TV STUDIO B
VIDEO MASTER CONTROL
PHASE I SEE FIG. 2
PHASE II ADDITION SEE FIG. 3
PHASE III ADDITION

FIGURE 4

PHASE III ADDITION TO BASEMENT

status sheets for the Library Building, other planning groups were doing likewise for the remaining areas of the campus; departmental representatives handled equipment lists for departmental offices and laboratories and key administrative officers of the University were assigned major common buildings on the campus, such as the classroom buildings and the lecture center. Various departments compiled lists reflecting their perceived needs and desires, and - as might be expected - the result was an uneven distribution of requests for audio-visual equipment. Consequently, upon the suggestion of the Director of OIR, the Chancellor directed that all audio-visual equipment items be placed under control of OIR.
(See Appendix E.)

This decision was made during the fall semester of 1964, prior to the move to the new campus and before equipment involved had actually been purchased. Thus OIR managed the entire procurement of audio-visual equipment as well as that originally designated for OIR areas in the Library Building.

The initial available budget for audio-visual equipment in classrooms and OIR was $220,000. These funds were expended as shown in Table B, and expanded in Appendices F and G. The decision to spend the funds in this manner was made by the Director after consultation with individuals who were advising OIR, with due consideration for the interest of the faculty as expressed on the departmental status sheets, and with reference to the standards for higher education published by the Department of Audio-Visual Instruction of the National Education Association. (See Appendix H.)

Table B

Equipment Purchased for Phase I

1. Television		
Camera and film chains	$107,000	
Videotape recorder	37,725	
Viewing equipment	12,500	
T. V. studio lighting	11,000	
		$168,225
2. Audio-Visual Equipment (See Appendix F.) For graphics, instructional materials and audio-visual department)		48,099
3. Workshops (See Appendix G.)		4,211
		$220,535

Equipment requirements for Phase II are shown in Table C. Costs estimated in this table were based on (1) national standards for institutions of higher education, (2) our own experience in actual costs of equipment, and (3) the stated needs of using departments.

Table C

Summary of Equipment Requirements for the Office of Instructional Resources, As Contained on Phase II Status Sheets

Library Building		
General Offices	$ 3,015	
Television Center	319,655	
Studio #2		
Master Control Room		
Television Tape and Film Room[1]		
Maintenance Room		
Television Remote Unit	89,952	
Audio Recording Studio	30,870	
Photographic Laboratory	55,559	
Library Classroom	2,015	
		$501,066
Architecture and Art Building		32,385
Science and Engineering Administration Building		14,663
Lecture Center		16,300
Classroom Buildings (2)		33,088
Science and Engineering Laboratory Building		38,033
Physical Education Gymnasium Television Observational System		85,760
	Total	$721,295

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[1] The Television Tape and Film Room contains the tape recorders, film chains, distribution switcher, and control equipment to support 64 audio-video carrels in another section of the Library. The carrels and their equipment are to be acquired from library equipment funds for approximately $64,000.

4. Personnel

Activities involving personnel fall functionally into two categories: planning and staffing. Planning determines the kind and number of positions needed to carry out the organizational tasks. Staffing provides the people to fill the positions. This section deals with both functions.

Initial planning called for the incremental acquisition of personnel, with a director to be available by July of 1964, and five key supporting personnel to be added during the academic year 1964 - 1965 as occupancy of the Chicago Circle campus made it possible to initiate operations and acquire equipment. These five positions included: two broadcasting engineers, a television director, a commercial artist, and a secretary.

One of the first tasks of the new director was to find people for the positions. Sub-tasks in this process included locating likely candidates, persuading them to join the OIR staff, and making arrangements for their hiring - the latter task being complicated by the fact that the majority of the positions in OIR were classified as non-academic, and as such fall under the provisions of the University Civil Service System of Illinois. In this system, positions are classified according to grade, outlining duties, defining qualifications, and prescribing salary ranges. One problem was that many of the positions created for OIR were not to be found in the existent classification system, and so in setting about to hire people it was necessary in some cases to find a classification that seemed close enough to permit employing the person needed, and in others to have new classifications established. With the rapid development of instructional resources on other campuses in the State of Illinois, these classifications will serve an extended group of people in various places, and in fact make it easier for other institutions to acquire instructional resources personnel.

As of April 1965, a plan had been developed involving the following positions for the academic year 1965-66:

Director
Head, Programed Instruction
Programed Instruction Specialist

Assistant in Programed Instruction
Graphic Arts Supervisor
Instructional Graphics Specialist
Set, Model, and Display Construction Specialist
Audio-Visual Supervisor
Instructional Materials Preparation Specialist
Instructional Materials Librarian
Audio-Visual Maintenance Technician
Chief Instructional Communications- Electronics Engineer
Instructional Communications-Electronics Engineer
Producer-Director
Producer-Director
Production Co-ordinator
Head of Learning Evaluation
Assistant in Learning Evaluation
Four Clerk-Stenographers or Clerk-Typists

As will be observed in the next section, the positions of the second producer-director in television, the instructional materials librarian, and head and assistant in learning evaluation were not approved for budgetary reasons. The division heads carried most of the effort in securing persons to fill the jobs, with the exception of clerical staff, who were referred to OIR by the Office of Non-Academic Personnel.

In acquiring personnel, there seemed to be no single approach that worked best. All avenues of approach and information need to be pursued. One factor seemed to emerge as a constant, however: an institution planning an Office of Instructional Resources can probably count on having to pay higher salaries than its preliminary estimates would indicate. The market price of media competence is constantly going up.

5. The Budget

Preceding sections of this chapter have dealt somewhat with budgetary matters, for it is hard to discuss matters of personnel, equipment, and services without involving money. In this section, the focus of attention will be only on the operating budget of OIR, since the initial equipment for the Chicago Circle campus came from special Illinois Building Authority funds and has been covered in detail previously.

After several months of operation a new budget was prepared for the following academic year (1965-66) with the help of the employed division heads. This budget was based upon the closest possible estimate of projected needs for services and the expense of providing these services. This budget is presented here in some detail in order to provide a realistic assessment of the cost for initial operation of a campus agency such as an Office of Instructional Resources.

Table D

Operating Budget for OIR for the First Year of Full Operation

Administration	
Director	
Secretary	
Wages, Expenses, and Equipment	$10,675
Programed Instruction Division	
Head	
Faculty Released Time	
Graduate Assistant Programer	
Clerk-Stenographer	
Wages, Expenses, and Equipment	10,519
Television Division	
Chief Engineer	
Closed-Circuit Television Engineer	
Producer-Director	
Producer-Director	
Wages, Expenses, and Equipment	29,450
Audio-Visual Division	
Supervisor	
6 Instructional Materials Specialist	
Audio-Visual Maintenance Technician	
Clerk-Typist II	
Wages, Expenses, and Equipment	20,375
Graphic Arts Division	
Supervisor	
Commercial Artist I	
Construction Specialist	
Clerk-Typist II for AV and TV	
Wages, Expenses, and Equipment	9,465
Salaries for all Divisions	139,400
TOTAL	$219,884

At the time of this writing, budget allocations had been made for the academic year 1966 - 1967, and the Office of Instructional Resources was increased by $116,600 including salary increases. This amount adds two academic programed instruction specialists, a television division head, an instructional materials librarian, an audio-visual technician, a photographic technician, a closed-circuit television engineer, a chief clerk, and a clerk-stenographer, with an increase in wages, expenses, and equipment amounting to $46,000.

B. Formulated Educational Plans and Procedures

This portion of the description of results is concerned primarily with the outcomes of the work of the faculty who were released specifically for the purpose of identifying departmental needs which might be met in significant part by the application of instructional technology. Initially, eight individuals were relieved one-third time to head committees in each of the following areas: German, engineering, mathematics, chemistry, English, biology, art and architecture, and business administration. These individuals were assigned specific responsibilities as indicated previously on page 16.

Four useful committee reports were submitted; the chairman of a fifth committee died before making a report but not before leading his group to some significant new media applications; a sixth committee did not appear to accomplish very much as a committee, but the department concerned developed a very significant curricular revision involving auto-tutorial instruction. Two committees appear to have been non-productive.

The next pages of this report will be devoted to excerpts from the committee reports selected by the authors of this report and with annotations also supplied by them.

1. Department of Mathematics, Reported by Professor Kenneth H. Murphy.

a. Identification of significant instructional problems.

(1) Frequent discussions with department heads and assistant heads.

(2) Frequent and continuous discussions with departmental colleagues.

(3) Discussions with members of other departments in the University:

(a) For purposes of getting additional insight and identification of problems from colleagues in departments with comparable problems.

(b) For purposes of obtaining observations from individuals in departments with a different set of problems.

(4) Discussions with consultants brought to the campus such as L. P. Greenhill, of the Pennsylvania State University; Kenneth Komoski, Teacher's College, Columbia University; John Barson, Michigan State University; Louis Forsdale, Columbia University; G. E. Warren, Temple University; Bertrand Masia, University of Chicago.

(5) Numerous discussions with staff members, department heads, and administrators of other universities.

(6) Studies of reports from other universities and departments having comparable problems.

b. New media or methods considered or tried.

(1) Large Lecture - Recitation. In a course which combines the topics of intermediate and college algebra for students unable to qualify for the regular college algebra course, students were grouped into two sections - one with 135 students and the other with 115 students - which each met for three hours a week. Material was presented by a lecturer using an overhead projector. The students also met in smaller groups of about 20 twice each week for recitation.

Although this was not a controlled experiment, the outcome convinced the department that this method could successfully be used in place of the more conventional arrangement in which students meet in small recitation groups five times a week. At the present time the large lecture-recitation arrangement is being used for some of the introductory math sequences.

(2) Programed Instruction. Available programs of instruction at the college level were carefully examined but none found seemed to be adequate. Much of the remedial pre-college mathematics is being phased out of the regular teaching program, but a substantial number of entering students are

encountered who need some kind of remediation before they are able successfully to pursue college level instruction in mathematics. The Office of Instructional Resources, which has a senior supervising programer, has employed another programer with particular interest in mathematics to begin programing remediation series for these students.

(3) Film Materials. A surprisingly large amount of filmed mathematics instruction was located and studied. However, none was found that was thought to be suitable either for use in current courses or for remediation. It is recommended, however, that a body of films could be selected which might have merit for enrichment and to provide extra instruction for competent and interested students beyond material for which there is time in class, or for purposes of review.

(4) Televised Instruction. It was proposed that an experiment be conducted with a portion of the college algebra course which instead of presenting material by large group "live" lectures would instead be presented by television. Although this experiment was approved by the department, it was entered into with some reluctance. However, on the final examination after the first semester, the television students clearly surpassed those students in the "live" section. Therefore, this course has been recorded on videotape and will be presented by television completely in the future. Furthermore, there are a number of introductory courses which have overlapping instructional requirements. These overlapping areas have been identified and the common instruction is being recorded on videotape for use at the appropriate time in all the courses to which it applies.

c. Recommendations concerning the administrative arrangements to facilitate effective and convenient use of new instructional resources.

(1) It is not too much to expect that instructional and communication methods of antiquity should give way to methods, media, and technology which make use of potential now accessible.

The technological aids the teacher today has potentially at his disposal are beyond belief. But to put these to effective use in meeting today's educational challenges the teacher must know them, believe in them, and be aware that 1890 vintage chalk talks can now be replaced by something better in the way of instructional communication.

Attitudes and support of the administration, at all levels, are all-important in inspiring and encouraging - or bringing to a standstill - adoption of new media. We need here an even greater willingness to learn vicariously from the experiences of other colleges and universities and to move forward accordingly.

(2) There should be channels and efforts available and known whereby support in the way of time and funds can be provided to those interested and competent so that their talents and energies can be involved in worthwhile projects.

[COMMENT: The University has instituted a program whereby faculty can be released full-time during the summer months at full pay to work on instructional improvement projects. A proposal may be submitted and endorsed by the professor's department and college, and approved by a university selection committee. In addition, individuals submitting the three best proposals are given an award of $1,000 cash.

Furthermore, faculty can and do receive substantial amounts of released time during the school year to pursue projects of instructional improvement endorsed by their department, college, and the Provost.]

(3) Projects on the frontiers of instructional media and their application should be seen as research at least as important as turning out a paper that the writer gets in print, or hopes to get in print. Research on instructional media and methods of communication of subject matter should result in increases of salary and rank as readily as writing papers and subject matter materials which become identified as research.

[COMMENT: The issue is really broader than this in that it relates to the question of whether excellence in teaching should be as well rewarded as research and publication. The question is a complex one about which we should like to make just one comment that is not usually encountered in discussions of it. It appears to us, at this institution at least, that the imbalance in reward for research versus teaching excellence is created and maintained by the faculty and not by the administration. Guidelines on promotion promulgated by the top administration offer equal opportunity for promotion for superior teachers, and promotions proposed on that basis have equal opportunity of approval. However, it is at the level of the faculty committees within departments and colleges that preference is given to research and publication as a basis for promotion in rank and pay. And, of course, only one's colleagues can confer prestige.]

d. Special Problems. [Paraphrased from Professor Murphy]:

(1) The majority of the faculty wanted to maintain small or modest size classes of approximately 20 or 30 students. The Committee, especially its chairman, was convinced that a serious effort should be made to use televised instruction, at least for a portion of the instruction in several of the freshman and sophomore courses. As a first step away from entirely small classes, a section of one course was conducted and organized around large group instruction with the instructor lecturing in a lecture hall using an overhead projector to make the written material visible. When this proved satisfactory, the department agreed to permit a course to be taught by television in which three lectures a week were televised and two meetings a week were in small quiz sections. This, too, proved satisfactory based on student performance in common course examinations and student attitude questionnaires. Consequently, two of the large introductory courses are now taught in this manner.

(2) Although the televised sections are taught by one person, the opinion in the department seems to be that it is inappropriate for him - or anyone - to direct or supervise the instructors of the quiz sections. As a consequence, the televised courses almost surely lack integration and cohesiveness. This problem is still unresolved.

2. English Committee, Reported by Andrew Schiller

[Professor Schiller's report is given in full with very minor editing.]

a. Identifying the Problem. In the Department of English there is unquestionably one problem which overrides all others in gravity and that is the problem of how to handle the ever increasing freshman enrollments - how to continue to give each student the kind of instruction in rhetoric which tradition demands and which their needs demand, and yet to do this in the face of an ever greater supply of students and an ever dwindling supply of instructors.

Instructional problems in the English Department in the fields of literature are not susceptible to innovation in any obvious way; that is, there seems to be no satisfactory substitute for the traditional student-teacher classroom relationship. It is of course possible to assist in the operation of this traditional classroom technique by such means as the overhead projector, filmstrips, closed-circuit television, and the like, but none of these essentially affects the traditional relationship between student and teacher.

Rhetoric, however, is a different matter. Here we encounter as nowhere else the problem of students in the mass. Here also we encounter another problem, namely, that the student is very likely to be taught by a young, inexperienced, and over-worked instructor. We encounter still a third problem, namely, that our students come to us with greatly differing kinds and degrees of preparation.

None of these facts quite applies to the upper level literature courses. It follows therefore that while there may be a good argument for conservatism in the teaching of literature, there are equally good arguments for rethinking our approach to the teaching of rhetoric.

My colleagues for the most part were willing to agree that the rhetoric program as presently constituted left a great deal to be desired. Moreover, even those who were willing to defend the rhetoric program as it presently exists were obliged to agree that it could not continue to exist so indefinitely. Consequently, from both the satisfied and the dissatisfied I discovered that an emotional climate existed within which some kind of change could be possible. When we faced the question, however, of what kind of change, it became very difficult to reach any kind of agreement. In fact, I would say that as a consequence not only of a good many committee meetings, private conversations, but to put it more largely, as a result of what I know from many years of teaching rhetoric, I know that it is quite impossible to reach any consensus among one's colleagues.

The conclusion, then, is that it is very simple to identify the most vexed instructional problem in the Department of English. On the other hand, it is nearly impossible to arrive at any agreement as to what ought to be done about it.

From this it follows that the only feasible avenue of action was simply to attempt to do something about it with or without a consensus among my colleagues. Should the new approach to be taken prove workable, then hopefully my colleagues might be sufficiently impressed by the example to follow suit. Propagandizing alone would never accomplish anything.

b. The Problem of Media. There are two ways to approach the question of new instructional media. One is to begin by asking oneself what new media exist. Then, depending upon the answer to this question, one can reshape his teaching methods accordingly. The second approach is to reverse the process, and to ask oneself what is the best possible way to teach this course. Then, depending upon the answer to this question, it is reasonable to explore the various instructional media in order to discover what contributions they can make toward the hypothetical ideal.

I chose the second method. As a result of this I came, over a period of time, to a number of decisions about instructional media. As it turned out, I decided finally to use a good many more than I might have suspected I would if I had gone about it according to the first method. Furthermore, when the need for a particular instructional medium did present itself, it did so organically; that is, it grew out of the intrinsic nature of the instruction.

The project itself will be described in Section e of this report, and there I will describe some of the specific techniques to be employed.

c. What are Other Schools Doing? The first problem was to discover whether or not at other schools other people might not already have solved some or possibly even all the problems which were perplexing us here. The first step then was to gather information. One of my colleagues sent out a circular letter to all the major universities of the United States asking what steps they had taken to face the problems outlined in Section a of this report. We received hundreds of replies, and I spent many days combing through these responses, which ranged from simple letters to extended curricula, looking for fresh and useful ideas. I did find a few, but very few. It seems perfectly clear from these responses that nearly all the American universities intend essentially to go on doing what they have been doing. I did discover that a few universities were operating, or were contemplating, writing laboratories or clinics. I visited one of these at the University of Michigan and discovered that their writing laboratory was far in the future. Concretely, their operation consisted of a few people who were in the process of composing a program and of six students who were their guinea pigs.

As a result of correspondence, of attending conventions, of conversations, and in some cases as a result of pure accident, I managed to learn of several other similar programs - for instance at the University of Houston, at Kansas State, at the University of Miami, at Wayne State, the University of Utah, Colorado State University, the University of Minnesota, and several other places. All of these have two things in common. In the first place they are rather limited in scope; and secondly, they tend to deal almost exclusively with remedial problems. None that I have been able to discover attempted the laboratory technique as the primary method of instruction in rhetoric, and certainly none attempted to use it on a university-wide scale.

The most stimulating example I was able to discover happened to deal not with the field of writing, but botany. I visited Professor Postlethwait's continuous laboratory at Purdue University. There I was able to observe the students at work and there I was able to convince myself that students, given a maximum degree of freedom and initiative which a laboratory allows, will pursue their business seriously and efficiently. I came away from this visit with no particular ideas about the mechanics of a writing laboratory, but somehow with the confidence that our students could be trusted to do their part conscientiously.

I was convinced that some kind of laboratory technique would work for the teaching of rhetoric. It remained to implement this conviction.

d. Getting Advice. Now began a process of educating myself. To a great extent this was done through the Office of Instructional Resources itself, which over the course of the year scheduled a series of meetings with expert consultants in various areas.

The English Department itself scheduled an all-day conference on the writing laboratory on February 13, 1965. For this conference we brought in two consultants, Richard Braddock of the University of Iowa, and Philip Lewis, Director of Instructional Materials for the Chicago Board of Education. As a result of this meeting it became fairly clear in our minds that it would be possible successfully to pursue the writing laboratory project, but that the project would entail a great deal of time and effort and would require a great deal of co-operation.

I was appointed as Project Director and OIR agreed to lend me the fullest co-operation both in personnel and resources. All that remained now was to develop a specific plan which could be implemented. We decided that the experiment was to begin in September of 1965.

e. The Project.

(1) The Problem. With the move of the University of Illinois in Chicago to its permanent quarters at the Chicago Circle, we were faced with the prospect of enlarging our enrollment from 5,000 to 20,000 by 1970 - quadrupling in five years. To compound the dilemma, we must contend with the fact that trained college teaching personnel are going to become more and more difficult to acquire. All these facts taken together point to a re-thinking of our technique of teaching rhetoric. We will simply not be able to go on as we have. We will soon run out of personnel, of space, and of funds.

The problem, then, is how to teach rhetoric in the face of these mounting difficulties. Any proposed solution, moreover, ought not to be merely as good as the present technique. There has been much dissatisfaction with that. We want to do even better.

(2) The Proposed Solution. The teaching of rhetoric involves six activities:

(a) The instructor talks to the students.

(b) The instructor and students engage in the discussion of the material.

(c) The student reads.

(d) The student writes and rewrites.

(e) The instructor gives individual counsel to the student about his writing.

(f) The student must remedy any defects he may have in the mechanics of writing.

Traditionally the instructor in the classroom deals with all of these aspects of the course. Our solution is to separate them and to deal with each in terms of its own demands.

(a) To the extent that an instructor simply talks to the students it is obviously possible to talk to many at once. Instead of talking to 20 at a time, he can talk to a group of 400. (This figure, the size of our pilot group, was dictated by the capacity of our largest lecture hall.) Under this plan only one person - the senior professor - prepared lectures, and these lectures were richly fortified with audio-visual aids well prepared in advance. There were two such lectures a week. Subsequently, instead of lectures delivered in person in a lecture hall, they were recorded on videotape and are now televised. Students may also review these tapes on an individual basis.

(b) Once a week each student reports to a tutorial session at a scheduled hour. Here he is assigned to a tutor who has an average of five students per hour.[1]

(c) As in any traditional course, the student is assigned readings. Primarily these serve two purposes: to furnish subject matter for his writing, and to offer models of rhetorical style. To the latter end, the readings and the lectures will be tightly co-ordinated. Close reading of a text is one of the continuing subjects of discussion.

(d) The student's writing is done on his own time, but carrels are provided where themes can, on occasion, be written on demand and - perhaps more important - where revisions can be made. The point is that the tutor can give the student oral criticism of his theme, whereupon the student can revise it and bring it back for immediate comment. Not only that, but we can grade the themes in the laboratory in the presence of the student.

(e) The student's activities are in general of two kinds - those in which he is guided by his tutor, and those in which he is expected to work on his own initiative. In the first category, each student is scheduled for one hour a week to a regular session under the supervision of a tutor.[2]

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[1] Classrooms for five students are uncommon. Plans are in progress to remodel an area to provide such tutorial spaces and, adjacent to it, necessary individual carrels and open areas for the instructional materials.

[2] There is a serious problem associated with the variability among tutors with respect to philosophy, approach and teaching technique which probably reduces the impact of the course as a cohesive instructional experience for students.

Thus, what in the normal rhetoric course is an occasional conference with the instructor, becomes now a regular, scheduled part of the instruction. Consequently, one of the chief compensations for the large lecture section is that each student actually has more personal contact with his tutor than ever before.

Each tutor's group is, of course, very small - an average of five. Moreover, we liberate the tutor from much theme grading at home in order that he be able to devote a maximum amount of time and energy to his students. One way to do this is simply to have the tutor read and comment upon short themes on the spot. Another way which is planned is to make tape recorders available so that tutors can record their critiques of each paper. When a student comes in he will be able to pick up his tape along with his folder, take it to a carrel and play it back.

In addition to the one weekly confrontation between student and tutor, the student is expected to make use of a writing laboratory for self-help - and for this reason the laboratory is continuously open. The self-help functions of the laboratory are mainly of three kinds.

(i) There is a "cafeteria" of materials available for spot remedial work, employed as needed, and as assigned by the tutor.

(ii) There is a series of programed units in rhetoric - to be used by all students - which consists essentially of applications and extensions of material offered in the lectures.

(iii)There is a structured series of graded exercises in writing, designed to lead toward the composition of the fully developed essay.

(f) All those portions of the course which do not or should not require primary supervision by the teacher are separated out and relegated to the self-instruction "cafeteria". To this end one portion of the laboratory is devoted to teaching aids of all kinds - books, programed material, tapes, and the like. If a student has problems in reading, spelling, grammatical construction and the like, he is simply referred to the proper resources which he employs on his own time. But it would be a mistake to think of these resources as useful merely for remedial work. Some of the material that properly belongs to the course can be programed or put on audio tape. Indeed, we must think in terms of supplying some of the materials for an enrichment of the course for the benefit of our superior students.

(3) The Ramifications. We foresee many benefits other than those which are obvious. For example, very few students at present receive proficiency credit in rhetoric. The reason is that we must make a simple binary choice of passing or failure. The writing laboratory will allow us a great deal of flexibility. A student, for example, could be passed on condition that he satisfy certain requirements in the laboratory.

Or to take another case, students who receive an "A" in Rhetoric 101 could be exempted from 102. Those who receive a "B" could be exempted only on condition that they satisfy certain requirements in the laboratory. "C" and "D" students would be assigned a regular 102 class. Thus the mere existence of such a laboratory would allow us to operate the course on variable tracks.

In short, this program, while it may owe its development to the urgency of mounting enrollments, is not just a desperate expedient. To be sure, we will employ all resources at our command. Nevertheless, the ultimate goal is to diminish regimentation, to break the academic lockstep, to deal with each student as an individual with unique needs and gifts - and to do this more efficiently than ever before.

f. Evaluation. We have acquired Dr. Bertrand Masia of the University of Chicago as a consultant in evaluation.

The process of evaluation should be conducted in terms of how well the project attains its own stated goals. That is, we do not intend primarily to conduct a comparison between the results of the pilot group and those attainable through the standard rhetoric courses. The two programs are far too different to make this kind of comparison meaningful, even though the goals may happen to be the same.

g. Administrative Problems. The chief function of administration in a project such as this is to facilitate the work by releasing time, by providing assistance, and by providing money for necessary research, travel, and materials. Above all this, the administration can perform one final function by proposing creative ideas.

In every one of these respects the present administration has been most helpful. At this point I can say that

I could have used more time and assistance, but I can not blame the administration for not supplying it. I had no idea myself when I took on this project that it would become so involved.

A still unsolved problem of major significance is the time and energy necessary for working out sheer management matters such as keeping track of students, sections, assignments, materials, and grades in the flexible setting afforded by this experimental system. This aspect of the course has probably been as time consuming as the design and preparation of materials for it.

3. Committee of the College of Art and Architecture, Reported by Professor Canio Radice

[With minor editing, Professor Radice's report is presented in full.]

a. General Procedures. The committee met regularly and generated an analysis of instructional problems in the discipline of architecture and art. It also encouraged suggestions from the faculty of the college and acted as an information dissemination instrument relative to new instructional methods. In addition to weekly meetings, the chairman had individual conferences with committee members at their request and with members of the faculty of the college in order to clarify matters related to the committee activity and to generate interest and activity relative to the problem of the use of new instructional methods and media.

b. Identification of Instructional Problems. In the College of Architecture and Art it was observed that there exists not one single detailed course syllabus. Courses with multiple sections are only loosely comparable from section to section. Instructional tradition in the arts tends toward the atelier or preceptoria approach to instruction. Instructors tend to follow their individual predilections based upon loose statement of course objectives. Some commonality is maintained through informal interchange between instructors. No attempt is made to guarantee correspondence of material used and/or procedures carried out in comparable courses. This condition contrasts greatly with the necessary detailed syllabi that must precede any programing of material. Because of differing opinions, approaches, material preference and emphasis from instructor to instructor, it is questionable whether agreement on more than segments of courses covering "body of knowledge" material can be achieved. Even then, detailed syllabi covering such material will have to be created before programing can occur. When programs have been produced, there is reason to question the breadth of use they will enjoy if present standards of academic freedom prevail. The committee is of the opinion, however, that competition of a kind similar to that prevailing in the textbook industry will result in good programs achieving relatively wide acceptance. With these thoughts in mind, the committee attempted to secure an analysis of the kind of problems that were common to all of the areas in the field of architecture and art and to identify those areas which were most completely subsumable under the heading of "body of knowledge". Because of the fact that a rather considerable number of different specific areas of instruction in these disciplines are dependent upon demonstration, it was determined that the whole area of matter that can be dealt with by demonstration could be produced in audio-visual or visual forms of one kind or another. It was also determined that there was a rather considerable amount of material which had to be learned which was almost rote memorization of a character and/or of a type depending little upon judgment that could be clearly described and therefore put into some form that would be thoroughly acceptable to all of the various individuals and disciplines within the fields of architecture and art. After some considerable discussion, it was determined that three areas of instruction should concern us for the initial period of our examination into possible use of new instructional methods and media. These were:

(1) The area of materials and methods of construction

(2) The area of freehand and instrument drawing

(3) The area of fundamental principles of design

The last - the area of fundamental principles of design - is the most controversial since it involves the greatest possibility for diverse opinions.

c. Survey of "New" Media and Methods of Dealing with Identified Instructional Problems. Having identified the prime areas for initial concern with respect to new media and methods of instruction, we then proceeded to an examination of the possibilities of media and methods used in connection with the development of new approaches to instruction in these areas. In the fields of architecture and art, there has been a long tradition of the use of visual aids. It has been common in the field to utilize the overhead projector, to utilize 35 mm slides, and to utilize opaque projectors of various kinds - the most common being the Bell Optican. In consequence, the utilization of visual aids is well entrenched in the field. Also, because of the fact that the manufacturers of architectural materials or building construction material have (as a part of their public relations programs) furnished schools of architecture with films relative to the manufactured products and/or raw materials being purveyed, a tradition of the utilization of sound motion picture film in connection with instruction in the fields of architecture and art has long existed. Our attention was, therefore, drawn to the consideration of programed material which has not been commonly utilized in the instruction taking place in the Departments of Architecture and Art and toward the utilization of motion picture film - more specifically, 8 mm cartridge systems. The consideration of the use of closed-circuit television was only peripheral due to the fact that the number of students which are handled in courses of instruction in the fields of architecture and art are seldom sufficiently numerous to warrant the kind of cost and involvement that characterize the utilization of closed-circuit television.

d. Consultants. We were unable to find any reports in existence indicating that either programed instructional units and/or cartridge 8 mm systems were in use in any programs for the instruction of architects and/or artists in any of the institutions about the country. In consequence, it was not possible for us to find consultants who were specifically oriented toward our field and our specific problems. We were able to use the consultants which were brought in by the Office of Instructional Resources with respect to matters relating to general problems of programing, the securing of information relative to general approaches to programing, the specialists in film *per se*, and in the use of film as instructional media in connection with other disciplines. Also, we were able to consult with evaluators relative to the problems of evaluation generally. But we were unable to find any existing material and/or specific experts directly related to our instructional areas.

e. Development of Program Proposals. After some consideration, three proposals were developed.

(1) Design theory.

(2) The production of demonstration segments in the form of single concept cartridge 8 mm film loops relative to materials and methods of construction.

(3) Programed instructional unit for the teaching of drawing. At the present time, it is intended to engage in preliminary production of selected segments of the proposed program of instruction for basic linear drawing for the purposes of developing prototypal segments that can be utilized to develop criteria for evaluation and experience in the problems of programing generally with the utilization of the 8 mm system as the medium.

f. Problems Relative to Implementation. Probably the most monumental problem relative to the implementation of programed instruction and the utilization of new media of instruction is the problem of funding the development of the programs themselves. Clearly, the development of programs of any kind and most specifically the development of 8 mm film programs is a relatively costly undertaking. In this University, and quite possibly in like institutions, the way in which fiscal matters are handled makes it difficult to engage rapidly in relatively high cost endeavors. It is also clear that the production of useful programs in any of the areas would require considerable expenditure of energy on the part of the people involved in their production and also would require a great amount of time. In consequence of this, it is unrealistic to assume that members of a faculty can engage in the production of this type of material in addition to the carrying out of their regular commitments. It is probably true that the most efficient way in which production of materials of this kind can be carried out is to assign individuals on a full-time basis to their production. This would require a well established procedure for the funding of projects that would permit the replacement of faculty assigned to the production of instructional material with substitute faculty to carry out the normal responsibilities. Additional discussion of this problem will be engaged in under the heading of "Administrative Problems." Other problems relative to the implementation of the utilization of new methods and media can be subsumed under the heading of the need to demonstrate to the faculty (engaged in the teaching of the various materials) that the new methods and media would be an adequate substitute for the present methods of instruction and would represent a significant advancement - either by way of improvement in quality or by way of improvement in efficiency with respect to instruction. In this connection, since there is no existing body of material to demonstrate the validity of the assumptions that the utilization of new media and methods would result either in efficiency or economies of faculty time and energy, we must first await the production of demonstration materials to deal with this whole problem area.

g. Plans for Evaluation. After consultation with professional evaluators brought in by the Office of Instructional Resources, it was determined that our original contention that no published reports of research into the best ways of dealing with programing and/or evaluations of programing were extant relating to the fields of instruction in the disciplines of art and architecture was valid. In consequence of this, it was determined that investigations into the best probable methods of programing and best approaches to evaluation would be engaged in after some initial production of material.

h. Physical Facilities Problems. At the present time, the College of Architecture and Art teaching facilities are in the nature of temporary facilities. A new building will be completed by September, 1967, for housing the instructional units under the Departments of Architecture and Art. This facility will have the flexibility which will permit the construction of individual carrels if it becomes desirable to have them for autotutorial instruction and at the same time it will provide facilities that will be ideal for group instruction by any of the various means that we can, at this time, foresee as being possible. In consequence, any difficulties that relate to physical facilities at the present time will presumably automatically disappear with the completion of the new building. Therefore, it seems appropriate not to anticipate difficulties - but to await completion of this building and its initial shakedown - before determining what difficulties will then exist.

i. Administrative Problems. Under the heading "Problems Relative to Implementation", I have indicated that there exists some considerable administrative difficulty with respect to making possible the relatively rapid production of material once it has been determined desirable to produce such material. Because of the fact that in the various areas of instruction there is a division of competence in any department - and because each department actually is responsible for many different areas of instruction (although the qualified specialists in a given area may have determined that it is desirable to introduce new approaches to instruction in their area) - it is frequently difficult to get the agreement of all of the other faculty in a particular department who are not specialists in the specific area under consideration. This difficulty is contributed to by the simple fact that it is difficult for any non-specialist in an area to visualize the possibilities in a given approach that is unfamiliar to them. Clearly, it would be considerably less difficult to obtain the agreement of the non-specialists in a departmental area if there existed demonstration material that would enable them to see the possibilities of the new methods and/or media. This difficulty, coupled with the problems of funding efforts to produce and test new methods and media, results in a considerable slowing down of progress.

It is my judgment that some considerable improvement could be effected if there were established, under the Office of Instructional Resources, an instrument that would be analogous to the University Research Board. It could have under its control all money intended for use in the area of the introduction of new methods and media of instruction. It could operate both as a quality control instrument and as an instrument for evaluating the possible effectiveness and desirability of a given proposed effort. With such a board in existence, the various departments could submit proposals akin to a research proposal to it. The board could evaluate these proposals and develop some system of priority which would determine which proposals should be supported by the funds available.

Since the Office of Instructional Resources has on its staff expert programers and evaluators along with experts in the various instructional media, it would be clearly possible for that Office to exercise a kind of quality control that would tend to guarantee that expenditures of funds in these areas would occur with the utmost efficiency. Most important, the time lag from project conception to implementation would be reduced to a minimum.

4. Committee on Engineering, Reported by Professor R. C. Kohler

a. Identifying Departmental Problems.

(1) Instructional problems were largely identified by and from four sources:

(a) Individual teachers especially interested in improving their teaching and alert to the needs of engineering education today and in the near future talked about their problems.

(b) A committee named by the college dean to study and encourage the use of technological aids and other newer teaching media to improve instruction discussed the issues.

(c) A college curriculum committee made plans toward formulating modern degree granting curricula in engineering.

(d) Departmental curriculum committees worked on developing and/or revising course content to meet the needs of a modern engineering curriculum. It was the interplay and exchange of opinions and ideas from all of these courses that resulted in the sifting out of some of the major problems confronting engineering education.

(2) Some of the major problems uncovered were:

(a) Our freshmen and sophomore students have, essentially, no early exposure to the professional careers for which they are preparing themselves.

(b) Entering freshmen do not know how to analyze a problem.

(c) The lighting and the construction of some of the engineering classrooms and laboratories on Navy Pier did not allow for the most efficient use of newer teaching media. Inefficiency and general difficulties sometimes discourage teachers from using some of the better and most efficient audio-visual materials available.

(d) Individual instructors should continually strive to do their best teaching. Higher education could improve enormously if more college teachers had the will and the resources to put to use the knowledge acquired slowly and painfully over years by trial and error. Much needs to be learned about the nature and conditions of human learning; but it is the utilization and incorporation of that which has been learned by the psychologist and researcher into a given course and teaching-learning situation existing in the lecture room or laboratory that will raise the individual to the heights of greatness as a teacher and enhance student achievement.

(e) Financial and necessary time requirements needed for study, development, use, and testing of newer teaching media should be studied and a functional administrative set-up developed that would expedite the necessary funds and time required for those faculty members who see an immediate need for newer teaching media. Unnecessary delays and obstacles often discourage initiative and result in nothing or second class methods and materials being used because of convenience and stifled inventives.

(f) There appears to be a need for some faculty and administrators to be informed about and educated in the use of the newer teaching media available today. There is considerable apathy to teaching aids and newer teaching media. Overcoming this apathy would do much to improve teaching and the courses offered by these same people.

(g) There needs to be an administrative awareness of the value and importance of good educational research, instructional resource development, and excellent teaching. There are indications that more and increasing emphasis is being placed upon scientific and technological research and publications - and that quality teaching and educational research and resource development is subordinated.

(h) There exists a need for an effective and objective system of evaluating the effectiveness of teaching. Administrators - department chairmen, deans, presidents - all voice concern about the quality of teaching; however, no real incentive for or progress toward improvement in this area will or can take place until objective and generally recognized criteria are developed and fully accepted by both teachers and administrators.

[COMMENT: A Course Evaluation Questionnaire (6) has been developed by the Measurement and Research Division, OIR, Urbana, which is a factored questionnaire, has university-wide and some departmental norms, and known high reliability. Research on reliability and standardization is continuing.]

(i) Some members of the College of Engineering teaching staff largely limit their thinking of technology and technological aids when applied to education, and more precisely to instruction, to the aspects of machines, systems, management, and control mechanisms. This limited concept probably is due to their being engineers or having limited teaching experiences. However, as educators and teachers of engineering, it seems a broader concept must be used for the fullest utilization and application of technology and technological aids in solving the instructional problems with which we are confronted.

(j) Teachers of engineering subjects are finding a need to keep pace with the technology of industry and the technological world. They must also keep pace with the technological teaching aids that are being developed to make classroom instruction more effective.

b. The committee recommends that OIR develop a test construction and evaluation service to assist instructors in evaluating their courses.

[COMMENT: Such a service has been developed in OIR, Urbana, and will be developed at Chicago Circle as soon as funding permits, hopefully within the next year or two.]

5. Committee of the College of Commerce and Business Administration

This committee did not report because of the untimely death of its chairman. However, it can be reported that the committee formulated and implemented an interesting use of television in the course *Business and Society*, and developed plans to use television in the introductory accounting sequences.

In the *Business and Society* course, arrangements were made to record interviews with a number of the top business leaders of the country. The interviews were structured so that information of specific relevance to the course was obtained. Those interviewed understood that their videotape-recorded interviews would be edited and that comments of the professor might be interpolated within the interview material in order to make it more meaningful and relevant to students in the course. During the first year of *Business and Society*, thirty televised presentations were taped and used. Among the business leaders interviewed by course instructors were: Arnold Maremount, President of the Maremount Foundation and prominent industrialist; Clarence Randall, retired president, Inland Steel Company; John D. Butts, President, Illinois Bell Telephone Company; Fairfax M. Cone, Chairman of the Executive Committee, Foote, Cone & Belding, advertising agency; Louis Lundborg, Chairman of the Board, Bank of America; and Leslie B. Worthington, President, United States Steel Corporation. Their participation not only added interest and timeliness to the course, but gave insights into the dynamics and values of the business world.

The accounting course began in the Fall of 1966 with two televised lectures per week and one programed laboratory. The individuals working in this course were introduced to these media through the work of the committee.

6. Committee on Biology

This committee did not submit a final report. The department completely revised its introductory biology sequences and implemented, with local revision, a system of auto-tutorial instruction adapted from that developed by Professor Postlethwait of Purdue University. (4)

The first operation of the auto-tutorial laboratory was heavily supported by OIR in the form of advice on the selection of audio cartridge tape recorders, the purchase of 8 mm film cartridge projectors, preparation of handouts, displays, and slides.

7. Inter-Campus Co-operation[1]

Inter-campus co-operation can usefully be thought of as occurring on two different levels, one administrative and the other between the teaching faculty. As was pointed out previously, the Office of Instructional Resources was conceived by faculty in Urbana, and detailed planning for it was carried out by specialists there at all levels from conceptual descriptions to technical details. The fact that there were specialists on the Urbana campus in all of the component activities of an Office of Instructional Resources (although not there organized in that way) was of crucial importance in being able quickly to organize and plan for this activity on the Chicago Circle campus.

In creating a new institution, we would recommend assignment of an officer of the parent campus (if there is a parent campus) to plan an OIR type activity with authority to call on relevant specialists on that campus or to secure necessary consultants. If there is no parent campus or if it does not have an officer who can perform this function, then the potential director of an OIR type activity should be employed early in the planning phase of a new institution and provided with sufficient funds to employ consultants liberally.

Co-operation between the respective Office of Instructional Resources on the Chicago Circle and Urbana campuses has continued at a very high level. The directors confer frequently and to their reciprocal benefit. Technical assistance flows somewhat more consistently from the parent campus to Chicago. It is by no means all in that direction, however, especially as the Chicago operation has begun acquiring special strengths that can be helpful in Urbana.

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[1] In an institution as large and as complex as the University of Illinois there are undoubtedly a host of inter-campus activities that cannot be reported here. This section deals with inter-campus co-operation of the kind that is likely to come within the purview of an Office of Instructional Resources.

Co-operation between the teaching faculties of the two campuses is practically non-existent. If it occurred, it would presumably be in the nature of mutual consultation and sharing of instructional resources (such as videotaped instruction). Time and the exigencies of the situation may change the present condition, but such change is not now in sight.

In considering inter-campus exchange of instruction, it is probably useful to distinguish between a campus which is a satellite of a parent campus and whose instructional program is administered and directed by the academic departments on the parent campus, and a branch campus which is academically independent of the departments on the parent campus. In the latter situation, which describes the Chicago Circle campus and its relationship to Urbana, the academic departments are free and indeed are expected to build toward independent excellence.

Although such an arrangement appears to us to be more likely to result in developing academic excellence than is the situation in which the branch campus remains an outpost of the parent campus, it is less conducive to campus co-operation. Faculty at the parent campus tend to be as unaware and uninterested in the new campus as they would be of any new campus. On the other hand, faculty at the new campus tend to be determined to seek their own salvation without reliance on "colleagues" at the parent campus. Such attitudes are highly inconducive to co-operation, and to date no significant interchange has in fact occurred. Perhaps as the Chicago Circle faculty coalesces and becomes surer of its worth, and the Urbana faculty becomes aware of much of merit that is already going on in Chicago, the two faculties can begin to interact as equals with common problems which may yield to common solutions.

CHAPTER IV

DISCUSSION OF METHODOLOGICAL ASPECTS OF THE STUDY

This chapter will be concerned especially with identifying and discussing those aspects of the planning and development of instructional resources which were particularly facilitated by the support provided by the U.S. Office of Education. The major categories of activities for which funds were utilized were three: (A) faculty released time, (B) consultants, and (C) visitations. In the normal course of operation, the Office of Instructional Resources would have engaged in these activities to a limited degree, but the study made it possible to carry them out at a level of sufficient intensity so as to be able to examine more fully the nature of each and to evaluate its contribution to the total development process.

A. Faculty Released Time

A faculty member's normal and assigned duties fall generally into three categories: teaching, research, and service to the University and to the community. These duties overlap in function - and certainly in time - and so it is often difficult to assess a professor's work load. To an unusual degree, he sets his own working hours around fixed class periods, and may do work at home during the day, as well as evenings and weekends. But time is finite, and an increase in one assigned duty calls for a decrease in another. Despite its drawbacks as an indication of professional activity, the "teaching load", consisting of the number of course credit hours taught, is the most common measure. And as misleading as the "teaching load" figure is, the simplest way to increase a professor's non-teaching duties is to decrease the number of hours of teaching. To undertake extra non-teaching assignments, professors want and need "released time" - as unfortunate as the connotations of the term are.

There are two particular advantages in such released time and its concern with the more effective use of instructional resources.

One advantage of released time is that it is tangible recognition of University interest in instructional development. Faculty members feel that it is one thing for pronouncements to be made about the need for instructional innovation, and as long as the work is to be done on the instructor's own time, the words are easy to say and unimpressive to hear. But when money is put up to support released time, faculty members feel that the concern is real. Indeed, as we observe the relative ease with which support for time and facilities can be obtained for research, as compared to the relative scarcity of similar resources for instructional improvement, we are drawn to the conclusion that the popular allegation that faculty are uninterested in teaching is probably untrue and is at least unproved. The faculty's apparently greater concern for research may simply be the usual, normal, and human response to that which society, through our educational system, best supports and rewards.

A second advantage of released time is that the work goes on within an academic department and the results are highly visible to other department members. When faculty members feel that they are actually involved in the process - and that many of the ideas used are their own - the probability of acceptance of innovation is higher than it would be if the ideas were developed outside of the department.

The mechanics of released time are simple. A portion of a professor's regular salary is paid from a different source for a particular period of time, and the funds are used by the department releasing the professor to hire a replacement to teach his classes. In this study, the selected professors were released one-third time to participate in the project for one academic year. The work of these individuals, both as members of the Instructional Resources Project Group (the term used to designate the released-time people) and as chairmen of departmental committees, has been reported in Chapter III.

Selection of individuals to participate in a study on a released time basis is both critical and delicate. First of all, faculty members display varying degrees of interest in the newer media of instruction, or in problems of instruction at all. Second, faculty members possess varying degrees of industry, brilliance, initiative, and creativity. Third, faculty members have varying degrees of prestige among their colleagues. It will sometimes be observed that persons who display the keenest interest in audio-visual devices and hardware may not be in the academic mainstream or enjoy high prestige within their departments. When this is true, their recommendations are less likely to be accepted by their colleagues, regardless of the quality of the work itself. Also, a department head with little interest in instructional improvement may be tempted to release someone whom he judges to be of lesser value to the department. Both situations must be guarded against.

To help insure the best results from released time, the faculty members selected should be given a clear understanding of the nature of the task, the kinds of results anticipated, and the resources available. Among the devices successfully employed were: regular group meetings of sufficient length and frequency so as to allow full exchange of ideas and problems, consultation with the study staff, and interim reports to codify experiences on a periodic basis. As is the case in most human endeavors, deadlines force individuals to rearrange their time and effort towards achieving results. On the other hand, in this particular study and with the level of individuals involved, a too tightly structured assignment might have hindered the in-depth investigation and creative solutions that the study was designed to produce.

In summary, granting released time was a requirement for faculty participation. The process involved a certain degree of risk, for worthwhile results are not a linear function of time released. But through released time, as borne out in the preceding chapter, the most significant effects of the study were achieved.

B. Consultants

The consultants brought to the Chicago Circle campus for this study can be categorized in three groups: those to provide faculty information and guidance, those to provide staff assistance, and those for specific tasks in connection with the study.

The first group of consultants appointed constituted an advisory group for the study. In this group were Dr. John Barson, Director of the Instructional Systems Development Project at Michigan State University; Professor Leslie P. Greenhill, Head of the Division of Academic Research and Services at the Pennsylvania State University; Professor L. C. Larson, Director of the Audio-Visual Center at Indiana University; and Captain John B. Haney, Associate Director of Instructional Systems of the Directorate of Audio-Visual Services, United States Air Force Academy (later Director of Chicago Circle OIR). This group met for two days in the Spring of 1964, shortly after the contract was awarded for the study, to guide in the selection of places which staff and faculty members might most profitably visit in order to see instructional innovations in operation; to suggest consultants who might be brought in to provide information and advice to the general faculty and especially to the released time group; and to review existing plans for the proposed Office of Instructional Resources.

Since the concept of the Office of Instructional Resources was at that time largely untried, the endorsement of this group was reassuring. The specific suggestions of institutions to visit and consultants to bring in was extremely valuable, particularly since the consultants on the advisory committee were in charge of pertinent activities, and so welcomed visits by Chicago Circle faculty members and OIR staff.

Dr. Bertram M. Masia of the Department of Education at the University of Chicago talked with each member of the Instructional Resources Project Group, visited classes and laboratories, read reports, and wrote extended analyses and recommendations for evaluation, both as to plans formulated and for evaluation services within OIR. The result of his contribution is implicit in the reports of the faculty committees in Chapter III.

During the Fall semester of 1964, two demonstration workshops were held to which the general faculty were invited. One, in early December, was an Exploratory Workshop in Course Development and Instructional Systems Design, bringing in Dr. Barson and Professor Greenhill, mentioned above as members of the advisory committee, and Mr. Kenneth Komoski, of the Institute for Educational Technology at Teachers College, Columbia University, New York. The workshop consisted of general presentations by each of the three consultants describing their direct experiences with course development in specific subject areas, and subsequent discussions with individual faculty. The report of the three, given orally at the end of the workshop, pointed out certain steps that the Director of OIR should take to advance the programs and provide support for their implementation.

Also in December, Dr. Louis Forsdale, of Teachers College, Columbia University, gave two demonstrations of 8 mm cartridge film systems. Both were attended by representatives of several departments, and, for most, the demonstration was an introduction to this medium. The demonstration sparked interest, especially in the Colleges of Engineering and Art, and within a short time, experimental 8 mm films were made on campus in engineering, art, and chemistry, and others purchased for physics and biology. All activity on the campus associated with 8 mm films is directly attributable to the demonstration by Dr. Forsdale.

A final campus-wide presentation by a consultant was made in April by Dr. G. Patrick Meredith, Head of the Psychology Department at the University of Leeds, England, and one of the United Kingdom's noted writers on instructional technology. His topic was "Towards a Taxonomy of Educational Media," and the talk was prepared especially for the Chicago Circle presentation, although he was touring the United States on other business at the time. The talk was published later in the AV Communication Review. (2)

Among the consultants brought in to work directly with departments were the following: Dr. Don Edwards, Professor of Accounting at the Michigan State University, spoke to the accounting and other business administration staff about programed instruction in accounting; Dr. Jack Forbes, Associate Professor of Mathematics at Indiana University, Calumet campus, discussed programed instruction - especially for remedial purposes - with representatives of the mathematics staff; and Dr. George Sanborn, Professor of Management at the University of Georgia, spoke to the business administration faculty about simulation in marketing instruction, involving computer scoring. The use of subject matter specialists whenever possible to discuss the use of the newer media is important. These individuals speak the language of the faculty department concerned, and their presentations have a disarming influence not always found in those who are perceived as media specialists.

The study also provided an opportunity for consultants to be brought in to assist in the planning of OIR facilities, and to look over the initial stages of operation to suggest ways in which they might be improved. Mr. Rudy Bretz, for example, not only inspired the television production staff, but he made a dozen or so specific suggestions that improved production, from changing light levels to redesigning baffles in the lecture halls. Mr. Donald Smellie, of the Audio-Visual Center at Indiana University, drew up recommendations for equipment and services for the instructional materials preparation laboratory. Dr. Robert M. Diamond, of the University of Miami, spotted an awkward working arrangement and emphasis in graphics, and suggested a change in supervision and physical location to alleviate the problem. Dr. Donald P. Ely, Director of the Instructional Communications Center at Syracuse University, advised the OIR staff on means of finding out about non-book instructional materials, means of storing this information for ready access, and policies towards rental or purchase of these materials. Prior to joining the OIR staff, Dr. Susan Meyer Markle and Mr. Richard Czina assisted in developing plans and specifications for programed instruction and television equipment respectively.

As a result of these experiences, some general observations regarding the employment of consultants are possible. It is best to have a specific task ready for the consultant to do when he arrives on the scene, and this is best made known to him in advance, together with such background information as may be helpful. This practice allows the consultant to prepare for the assignment by gathering both ideas and materials prior to the trip.

While consultants are particularly useful in supporting one's recommendation to administrators and faculty members, it is not wise to pre-judge what a particular consultant will say. Honesty results in a consultant's recommendations being corrective as well as supportive. To be specific: one consultant quickly spotted that the work flow in instructional materials hindered an easy faculty access, and that television lessons were overly long and without specific directions for student activity. Procedures were changed to correct these conditions.

While the consultant should be free to talk with staff, faculty, and administrators without the constant presence of the person who arranged to bring him to the campus, it is best to round out the consulting period with a report, preferably both oral and written. The consultant makes notes while he is on the scene and gives his first impressions at the conclusion of the period; the written report is mailed shortly thereafter, and helps to codify and clarify the observations and recommendations.

C. Visitations

On the assumption that nothing convinces like a visit, an important part of the study consisted of selecting sites of exemplary instructional innovations relevant to the courses taught at Chicago Circle, and in sending faculty persons to see them first hand and report back to colleagues and OIR staff. The following are some of the trips taken by Chicago Circle faculty under this program:

In October, 1964, a group from Biological Science visited Purdue University to observe the auto-tutorial laboratory in Botany. This visit had marked impact on the faculty members who went, for the group soon afterward developed plans for adopting the idea for this campus, expanding the content taught by this method to the other biological sciences.

During the break between the close of the first semester in the academic year 1964-1965, a group of faculty members visited Michigan State to observe the developments described by Dr. John Barson in his talk at Chicago Circle during the previous month. Of particular importance were closed-circuit television in accounting, which demonstrated the practical application of an audio talk-back system,and a special project there on the selection of portions of available 16 mm films which could effectively be extracted for use in 8 mm film loops. Professor Schrage of the Chemistry Department was planning such a project to be independently conducted the following summer, but after seeing the Michigan State project, he was able to build on the work done there. At the University of Michigan, the group talked with members of the staff of the Center for Research in Teaching and Learning and the English Department for methods of writing development. The members of the group included representatives of Business Administration, Chemistry, Geology, English, and OIR, and the visit provided a more extensive discussion of instruction on a cross-discipline basis than had been possible to arrange at home on the Chicago campus.

Other, shorter visits were made as follows: to Michigan State University to observe televised instruction in women's gymnastics and dance; to Pennsylvania State University to observe televised instruction in accounting; to the University of Colorado to secure materials and recommendations on the newer media in earth science programs; to the University of Wisconsin and the University of Pittsburgh to observe large-group instruction in college algebra; to the Massachusetts Institute of Technology to observe the science film projects in progress; to the National Gallery of Art to observe the unique use of the exhibit as an instructional medium; to Temple University to observe televised instruction in business education; and to the University of Miami to observe program development in remedial instruction in mathematics.

Often a trip was the dividing point between lukewarm interest and vigorous pursuit. Some visits resulted in confirmation of ideas previously held, but strengthened by observation of a successful operation. One visit prevented a needless duplication of effort. Faculty reports were of considerable use in diffusing interest within departments. "I have seen it work," is a disarming phrase for the agent of change.

Travel provided by the study also contributed to the development of the OIR staff. The Audio-Visual Supervisor visited Indiana University and Syracuse University to observe production arrangements and classroom features. The Programed Instruction staff visited the University of Michigan to observe the workshop practices of the Center for Programed Instruction in Business. The Chief Television Engineer visited two educational network centers and a factory seminar on closed-circuit television planning. The Graphic Arts staff visited the Television Office at the University of Michigan to learn techniques for television graphics. The Director visited Oakland Community College and Grand Valley State College, both in Michigan, to observe study carrels and auto-tutorial instruction on a large-scale basis.

Many important discussions and demonstrations occurred at meetings of academic and professional societies, and visits to such meetings were combined with trips to other centers of innovation to make most worthwhile use of time and money. For example, attendance at the Instructional Television Conference at Miami enabled the Director to visit the octagonal lecture center at the University of Miami and the production facilities at Florida Atlantic University, in addition to participating in the new media sessions of the conference.

Some observations about the methodology of visitation are in order for this report. One point can not be overstressed: the need for prior planning and co-ordination before visitations. Not only must one do his homework about the innovation to be observed, but definite arrangements should be made regarding purpose, objectives, arrival, accommodations, personnel, etc. Since the desired people are not always on campus, and activities are not always available for observation, it is best to telephone - not write - to discuss arrangements and pose alternatives. Letters can follow up and confirm, but if used as the sole means of communication, can be delayed or misdirected, and so greatly lessen the value of a visit. With proper pre-planning, an agenda can be worked out which will enable the visiting party to cover desired areas.

It is especially useful for groups to take a trip rather than an individual, when schedules and budgets permit. Two persons, for example, can see different things at the same time, when interests are divergent, and yet get different points of view on a single activity when interests are similar. The discussion that occurs during a visit, and which results from a visit, is often the critical factor in gauging how an innovation might be transferred from one institution to another.

One point might be said from the standpoint of the institution visited. It seems that if innovation comes, visitors can not be far behind, and generally they are welcome. But a person in charge of an operation can find himself spending a disproportionate amount of time showing visitors around and answering questions. It has been found useful to have a slide presentation and a brochure available about the general aspects of an operation.

The dissemination device of visitation needs further evaluation and examination in order to increase its effectiveness and efficiency, both for the visitors and the visited.

CHAPTER V

CONCLUSIONS

The first task involved in this project was to develop the concept of a campus organization responsible for instructional resources, and to develop plans for implementing it in terms of the necessary staff, space, facilities, budget, and organizational structure. Concurrently, a sample of the faculty had to be immediately involved in planning for the uses of instructional resources in a manner significantly related to the solution of real instructional problems.

The study was not experimental. There was no attempt to compare different methods to accomplish the required task. Rather, the procedures were structured according to the best judgment of the investigators and the report is, essentially, a description of these procedures and their outcomes.

It is now appropriate to discuss the outcomes with respect to the two tasks of planning for services of instructional resources and planning for the uses of instructional resources in terms of the initial statement of objectives for the study.

Objective A. To identify critical problem areas in University instruction to which the full application of instructional resources can make a significant contribution.

There were faculty committees formed in eight disciplines. The English Committee identified freshman rhetoric as a fundamental problem and instituted an experimental program involving extensive use of programed instruction and of television, in association with more intensive small group seminars. The Mathematics Committee identified the problem of maintaining quality in the introductory courses, and has initiated carefully prepared televised instruction in an effort to stabilize and improve instructional quality. A Committee of the College of Commerce and Business Administration has systematically involved business leaders in a televised introductory course in order to bring the reality of the business world to the students, and it has also initiated the use of television in accounting. The Committee on Biology did not directly develop new applications of media, but as an indirect result of its studies the department has initiated the extensive use of audio-tutorial instruction, along with the regular use of tests and test analyses to guide their further development of this procedure. The Committees on Art and Architecture and on Engineering suggested only minor reforms. The work of the two remaining committees did not seem to be productive.

On the basis of the outcomes of the work of four of the eight faculty committees, it seems reasonable to conclude that the project was moderately successful in affording the faculty opportunity to identify important problem areas in instruction and applying newer instructional resources to their solution.

Objective B. To propose and test forms of administrative and professional encouragement to faculty to make use of instructional resources.

Fundamental encouragements initially offered were: Released time (for the faculty committee chairman); travel funds; and funds for the employment of consultants.

Our observation is that released time for the faculty to plan instructional resources is absolutely essential. Furthermore, the committees pointed out that time to implement innovation is equally necessary.

The remaining factors of travel and consultation were less uniformally needed or effective. When consultants could be identified who could speak to specific problems of a department, they tended to be useful. General consultation, without specific reference to concrete problems, was less so. Certainly, when other institutions, with standards and programs perceived as being similar, were identified and were known to be successfully employing a significant instructional innovation, a personal visit frequently proved to be quite useful.

Thus funds for travel and consultation should be available, but they need to be discriminately employed.

The faculty committees were concerned about the means of rewarding excellence in teaching. This is a general problem among institutions of higher education. We did not solve it.

Objective C. To identify needed changes in curriculum and methods for the most effective use of instructional resources.

This project did not result in major modifications of curriculum or institutional methods and procedures. In general, The use of new instructional resources was super-imposed upon rather traditional curricula and ways of doing things in academia.

Objective D. To plan for the proper administration and use of facilities and programs.

Objective E. To plan facilities consistent with the projected requirements.

Objectives D and E are so inter-related that they can both best be discussed together. A conceptual framework for the institutionalization of instructional resources was developed; an organization for an Office of Instructional Resources was developed and has been largely instituted; personnel, operating and equipment budgets were developed and made operational; space requirements were developed; specific equipment was selected. These factors are all reported in detail in the body of the report.

Planning for the institutionalization of instructional resources went on within the context of a new institution which was planned, primarily, by staff of an established institution. Thus it was that initially individuals from the established institution had sufficient time and motivation to provide the necessary leadership and expertise. Later, staff for the Office of Instructional Resources were employed at the new site, and gradually took over planning, revision of plans and implementation of plans.

It is of fundamental importance to recognize that at the outset there were available individuals with the interest, motivation and experience necessary to give form to a conception of this sort and to make a place for it within the developing institution. Were it not possible to draw heavily upon the resources of another institution, it certainly would be necessary to involve a resident director from the outset, and make it possible for him to liberally employ consultative help.

CHAPTER VI

SUMMARY

This report is a description of a project in which the first task was to develop the concept of campus organization responsible for instructional resources, and to develop plans for implementing it in terms of the necessary staff, space, facilities, budget and organizational structure. An equally important concurrent task was to involve a sample of the faculty in planning for the use of instructional resources in a matter significantly related to the solution of real instructional problems.

With respect to the first task, the report describes how an Office of Instructional Resources was conceived and implemented in a developing urban university. The report details the organizational structure; the personnel, operating and facilities budgets; the number and kind of staff required; the space required; and the equipment recommended.

Faculty involvement was brought about by the appointment of faculty committees in eight important subject areas whose task it was to identify critical instructional problems in their discipline and to develop applications of instructional resources related to their solution. The chairman of each committee was released part time from other duties in order to provide the necessary leadership; consultants from about the country who could contribute to the solution of the identified problems were liberally employed; and the committees were given the opportunity to travel to other institutions in order to observe and to discuss examples of significant innovations in their instructional areas.

The work of these committees is reported in considerable detail and their accomplishments are discussed.

In brief, four of the eight committees did in fact identify significant instructional problems and set in motion projects using newer media to solve them. This was concluded to be a reasonably successful effort in instigating instructional innovation.

It was concluded that providing adequate released time for the faculty to work on matters of instructional improvement was vital to their work.

It was concluded that provision of funds for faculty travel and thus employment of consultants, if related to the real needs of departments, was quite important.

The extensive treatment of budgets, staff, space and equipment should be of value to others planning a similar campus service.

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APPENDIX A

A STATEMENT ON THE CONCEPT OF COURSE DEVELOPMENT BY L. P. GREENHILL, DIRECTOR OF ACADEMIC RESEARCH AND SERVICES AT THE PENNSYLVANIA STATE UNIVERSITY

One of the most productive trends just beginning is the concept of course development. This involves a number of steps: First, the objectives of the course are analyzed and restated in terms of what should the learners be required to know and do as a result of studying the course. This will not be expressed in a paragraph or two of generalities; it should be described in a number of pages of detailed requirements.

With carefully defined behavioral objectives it is not difficult to build appropriate tests to assess whether the students can achieve the goals. At the same time, performance standards can be specified. For instance, it might be required that 90% of the students score 80 or higher on the criterion test.

Next, it is appropriate to think in terms of the content that will provide the necessary knowledge students will need to meet the behavioral requirements. Organizing the subject matter for optimum learning and making decisions about the most appropriate method of presenting the content are next.

Here it is appropriate to consider a variety of learning situations and combination of media, and to build in requirements for student responses which will provide the best conditions to stimulate learning. In addition to the main materials and methods of presentation, thought should be given to appropriate supplemental materials and learning opportunities, which may include textbooks, references, especially prepared study guides, assignments, tests for self-evaluation, programed materials, recordings, laboratory activities, etc. Ample opportunity should be provided for students to practice what they are learning.

When each lesson or instructional unit is completed it would be desirable to record it on film or videotape. The recorded lesson, along with the appropriate supplementary materials or activities, could then be tested empirically with appropriate groups of students and the previously developed criterion test could be used to see whether the learners can reach the predetermined standard of performance. If they can, the lesson is accepted; if not, an effort is made to discover and strengthen the weaknesses.

It is believed that such a procedure will lead to considerable improvements in learning as compared with the present "hit and miss" method of preparing courses and testing students. However, to achieve such results requires a team effort of considerable magnitude involving competent content specialists and outstanding teachers, learning psychologists, test construction experts, production specialists, programers, and the like.

In addition to competent personnel, adequate supporting funds for released time and the production of the necessary instructional materials is essential. In order to justify such expenditures, maximizing the use of such recorded multi-media courses should be considered. For example, they could be used repeatedly within an institution, and arrangements might also be made for their distribution to, or exchange with, other institutions. In either event, provision should be made for the updating or revision of sections of the courses to prevent obsolescence.

APPENDIX B

MEMORANDUM TO THE STAFF

OIR SERVICES SPRING QUARTER 1965

The Office of Instructional Resources was established last July in part to provide a comprehensive and co-ordinated service so that faculty members might use a wide variety of teaching materials and media conveniently and effectively. As the first step toward a comprehensive program, OIR now has a staff of four specialists and enough equipment and facilities to offer certain services during the Spring quarter. This memorandum describes these services and advises how faculty members can obtain them.

AUDIO-VISUAL EQUIPMENT

The Audio-Visual Division has acquired a limited amount of new projection and sound equipment, in addition to the older equipment formerly handled by Physical Plant projection service. At present, the A-V Division can supply the following on a first-ordering, first-served basis:

16 mm sound motion picture projectors
Overhead projectors, compact model
35 mm 2 x 2 slide projectors, automatic and manual
Filmstrip projectors, automatic
3-1/4 x 4 lantern slide projectors, manual

By April 1, additional equipment should be on hand:

Audio tape recorders
Phonographs
Projection carts

How to Obtain Audio-Visual Equipment:

For "one-time" use, call the Audio-Visual Division on extension 2751 and provide the following information:

Type of equipment
Room and building
Instructor's name and department making request
Date and time

For extended period loan, visit the A-V Office in Room 1-477, located in the northwest corner (OIR area) of the first floor of the Library.

Some equipment, such as overhead projectors, will be kept in the classrooms where frequently used, or in nearby preparation rooms. The A-V Division will deliver and pick up other equipment and materials and provide classroom technicians when needed and desired. The A-V Division will provide check out service and practice for faculty members who want to do their own operation of the self-loading film projectors and automatic slide projectors now standard with OIR. In view of the realities of college teaching, we are setting no lead-time deadlines based on our own convenience or even efficiency. The best co-operative relationship is for instructors to request equipment and technicians as soon as requirements are known, and for OIR to make every effort to cover emergency requests for unanticipated needs.

OIR audio-visual equipment may be used without intra-University charges. When needed, classroom technicians are provided without intra-University charge for instructional showings in connection with academic courses. When classroom technicians are requested for non-instructional activities or events, using departments will be asked to reimburse OIR on a Stores Voucher for the payment of the technicians.

FILMS AND RELATED MATERIALS

The A-V Division will handle arrangements for film rentals and loans from sources outside the campus. For details on how to obtain information about film titles, call or visit the A-V Office. When a needed film has been identified, call or send a letter to the A-V Division with the following information:

Title of film and its source
Instructor's name and department making request
Room, building, date, and time of showing

Note: Most film rental companies require at least three weeks time to supply films, and since their reservations are made on a first-come first-served basis, it is well to have arrangements made well in advance of the desired showing date.

For further information about any aspect of the use of audio-visual equipment or film rental, contact the Supervisor of the Audio-Visual Division, Mr. Raymond Ramquist was formerly Audio-Visual Director at De Paul University and has recently completed the Master's degree in Audio-Visual Education at Indiana University.

INSTRUCTIONAL MATERIALS

Certain functions of the Graphic Aids Center at Navy Pier have been incorporated into an Instructional Materials Laboratory in OIR. This Laboratory has a do-it-yourself area, where faculty members may come to prepare Thermo-Fax rapid transparencies, Master-Fax rapid ditto masters, and signs or charts using drafting tables and lettering equipment. The Laboratory also has a professional service, capable of making rapid Polaroid 35 mm slides and 3-1/4 x 4 slides. In the near future, this professional service will include diazo transparencies and 35 mm color and black-and-white slides or high-contrast photography. There are no intra-University charges for using equipment in the Instructional Materials Laboratory.

When obtaining materials for use in instruction, departments will be charged only for materials used. Upon arrangement with each department, departments will be billed monthly on a Stores Voucher for any charges accrued by their faculty or staff members. In this way, these services can be immediately available to faculty members without delay or red tape. When professional services are rendered for non-instructional purposes, departments will be asked to reimburse OIR for the cost of labor.

The Instructional Materials Laboratory is located in Room B-463 in the north end of the basement of the Library. For further information, contact Mr. Edward Caldario, extension 2713. The Laboratory is open from 8:30 to 4:30, including the lunch hour.

GRAPHIC ARTS

The Graphic Arts Division is ready to prepare art work for slides and transparencies, to design printed materials for distribution to students, such as handouts and syllabi, and to design instructional exhibits or displays. There is no intra-University charge for preparation of graphic arts work for instructional purposes. For graphic arts services for non-instructional purposes, arrangements may be made with the Director of OIR. In charge of the Graphic Arts Division is Mr. James Axeman, an alumnus of the Institute of Design, and an award-winning free lance designer in Chicago before joining the staff of OIR. His office and work area is in Room B-466 in the north side of the basement of the Library, extension 2715.

IDEAS, ATTITUDES, AND PLANS

Faculty members with ideas for projects that might improve instruction - from a part of a lesson to a course - are urged to contact the Director of OIR or Dr. Allen Howard on extension 2748. OIR has a special fund for pilot and experimental work and has information on obtaining support from the USOE Small Grant Program.

The attitude of the staff of OIR is that faculty considerations come first. We pledge co-operative effort in the selection of commercially available materials and in the preparation of special ones. We are particularly receptive to expression of faculty needs for additional services.

The plans of OIR for the newer media of television and programed instruction, and for learning evaluation service, are becoming realized. A television system will be installed in the basement of the Library Building during April. The Head of the Programed Instruction Division will join our staff in July. More information will be disseminated as these divisions approach actual operation.

OIR is endeavoring in the meantime to provide a first class, efficient service in the conventional instructional resources. I would like to hear from you directly when you feel our service could be improved. Please call me on extension 2748.

APPENDIX C

MEMORANDUM TO THE STAFF

OIR SERVICES FALL QUARTER 1965

The current national interest in the quality of instruction, expressed by faculties, students, parents, and the press, is coming at a time of increased pressures for better utilization of resources, caused by scarcity of staff, space, and funds. Particularly on this campus, these abstract problems become as concrete as our buildings, and as personal as the students we meet and the colleagues with whom we work.

Clearly, only those who are teaching can make the necessary crucial responses to demands for better teaching. But the University of Illinois at Chicago Circle is providing a number of programs and services that can be of significant help. The Office of Instructional Resources was established last year in part to provide a comprehensive and co-ordinated service so that faculty members might use a wide variety of teaching materials and media conveniently and effectively.

I would like to describe this Office, and to explain how you can make use of our consultation, production, and operational services in your teaching.

PROGRAMED INSTRUCTION

This Division is concerned with the systematic development of psychologically sound and empirically validated instructional materials to facilitate independent and individualized student learning. The Division performs the following services:

1. Assists in locating and trying out programs written elsewhere which might have application to Chicago Circle courses. Now on hand is a growing collection of catalogs, sample programs, and descriptive folders of programed materials prepared by commercial firms and other colleges and universities. Many programs are sent to the Head of this Division while still in the experimental stage.

2. Guides faculty members in developing programed materials specifically for Chicago Circle courses.

3. Presents orientation sessions and workshops in programed instruction.

4. Conducts research in programing methods and techniques.

The Programed Instruction Division is headed by Dr. Susan Meyer Markle, Associate Professor of Psychology. Her office is in Room 1-476 in the Library Building, and her telephone extension is 2748.

TELEVISION DIVISION

This Division applies the communications medium of television to instructional requirements, largely involving the storage and distribution of lectures, interviews, demonstrations, and discussions, but also providing for the analysis of student and faculty performance in speech, athletics, and the performing arts.

In the basement of the Library Building is located the Television Production area, with one completely equipped television studio, master control center, and projection room. Major equipment items, all of the latest solid-state design and broadcast quality, include two studio view-finder plumbicon cameras, a vertical interval studio switching system with special effects, two film camera chains with motion picture and slide projectors, and a standard quadrature videotape recorder. At present, television signals can be originated only in the television studio (except for the self-contained system in the Physics Lecture Hall), and signals can be received on sets in large lecture halls 165 and 167, and the six small lecture halls around 193 in the Lecture Center, the conference rooms 1550 and 1950 in University Hall, plus certain classrooms in Douglas and Burnham Hall. It is possible to activate other television outlets, which are located in all classrooms.

For the Fall quarter, the televised lecture portions of two courses are regularly received in Chicago Circle classrooms, plus demonstrations and model performances for another course. Faculty members are invited to explore the use of the television system for recording off-the-air commercial and educational programs for student viewing in or out of class. Arrangements should be made as far in advance as possible by phoning the Television Production Co-ordinator, Mr. Donald R. Pukala, Room 1-474 Library Building, extension 2750.

AUDIO-VISUAL DIVISION

The more conventional instructional resources are administered in this Division, although several innovations and technological breakthroughs in familiar media are making possible their more pertinent and convenient use. There are three departments to the Audio-Visual Division:

Equipment Loan and Repair Department: Attached is a form which can be used to order audio-visual equipment for classroom use. It lists the types of equipment which are available either for long-term loan, when needed by a particular department in a particular area for frequent or ad hoc use throughout a quarter or for one-time use, in which case the equipment may be picked up by the requesting faculty member in Room B-461 in the basement of the Library Building, or delivered to the classroom where needed. In most cases, an operator for the equipment can also be provided. Orders for equipment delivery or reservation can be made to Mr. Henry Walli, Room B-461 in the basement of the Library Building, extension 2713.

Instructional Materials Acquisitions: Our current practice is to rent films which are needed in Chicago Circle classes. In Room 1-477 is located a collection of up-to-date catalogs of films and filmstrips from major rental libraries, with materials listed by academic subject and level. You are invited to come in and look through these catalogs and to arrange for a preview or showing of films which would further course objectives. When films have proven their value to a department and their use can be projected over a considerable period of time, it is possible for OIR to acquire them on a lease-purchase plan to have them always available. Since most film rental libraries reserve films on a "first-come, first-served" basis, it is wise to make reservations as early as possible, for even administrative lead time in the rental library may take two weeks. The person to see or call for help in selecting instructional materials is the Audio-Visual Supervisor, Mr. Raymond Ramquist, Room 1-477 Library Building, extension 2751. If you know the title and source of a film, contact Miss Karen Vice, Room B-463 Library Building, extension 2713.

Instructional Materials Preparation: There are two approaches towards instructional materials preparation. One is a "do-it-yourself" facility, where faculty members can come and sit down at a drawing table and be provided with pens, rulers, lettering guides, light box, etc., for the preparation of signs, charts, and masters for Thermo-Fax overhead transparencies. This facility is in Room B-463 in the basement of the Library Building. The second approach is a professional service, utilizing paid staff for instructional materials preparation. In this category, the following services are available:

1. Preparation of original art work for instructional charts, diagrams, handouts, slides, and overhead transparencies. (In collaboration with Graphic Arts Division.)

2. Making of 35 mm black-and-white and color slides, 3-1/4 x 4 slides, and Polaroid black-and-white prints.

3. Making of overhead transparencies, using high contrast photography, diazo printing, and rapid thermal methods.

4. Mounting and laminating of instructional materials on poster board.

5. Duplicating and editing of audio tapes.

6. Making of 16 mm silent motion picture film footage, and 8 mm film loop cartridges.

The manager of the Instructional Materials Preparation Laboratory is Mr. Roger Pscherer, Room B-463 Library Building, extension 2713.

GRAPHIC ARTS DIVISION

In addition to preparing art work for slides and transparencies through the Instructional Materials Preparation Laboratory, this Division deals directly with faculty members in designing printed materials for distribution to students, such as handouts, brochures, and syllabi, and for designing instructional exhibits and displays. The latter are constructed in the Set, Model, and Property workshop of this Division. For this design service, contact Mr. James Axeman, Graphic Arts Supervisor, Room B-466, extension 2715.

EMERGING DIVISIONS

Learning Evaluation: While this Division has not been staffed or funded, the OIR at Chicago Circle has made arrangements with the Measurement and Research Division of OIR at Urbana-Champaign to score certain multiple choice examinations and to present test interpretation data. This service makes use of optical-scanning answer sheet readers, key punches, and a computer and high-speed printer. For information contact Dr. John B. Haney, Director of the Office of Instructional Resources, Room 1-478 Library Building, extension 2748.

Course-Development: At present, the various members of the staff of OIR combine to work with members of an academic department systematically to approach a particular course, usually a large enrollment one. In this process, the members of the group and the faculty define the objectives of the course, analyze the structure of the discipline, devise instructional groupings and activities, select teaching methods and media, realign personnel and material resources, and co-ordinate the production of materials and evaluation instruments. An example is Rhetoric 101X,in which OIR is co-operating with the Department of English.

A NOTE ON CHARGES FOR SERVICES

Since it is the intention to encourage the use of instructional resources in teaching Chicago Circle classes, as well as to facilitate their use, the Office of Instructional Resources provides most of its services without interdepartmental charges when used for instructional purposes. Included in OIR-provided services are equipment loan, classroom technicians to operate projectors, design services, film rental, television production and distribution, programed instructional materials, and exhibit construction. Interdepartmental charges are made only for the supplies actually used in preparing instructional materials and for outside contract costs for type and printing of publications. Since OIR is budgeted under the category of instruction, work performed for non-instructional University purposes will be performed only on the condition that OIR be reimbursed for materials and wages through a revolving account for Instructional Materials Services. "Non-instructional purposes" includes administrative and research projects.

IDEAS AND ATTITUDES

Faculty members with ideas for projects that might improve instruction - from a part of a lesson to an entire course - are urged to contact the Director of OIR. We have a special fund for pilot and experimental work and have information on obtaining support from the USOE Small Grant Program.

The attitude of the staff of OIR is that faculty considerations come first. In view of the realities of college teaching, we are setting no lead-time deadlines based on our own convenience and optimum efficiency. The best co-operative relationship is for instructors to request equipment, technicians, materials, and services as soon as requirements are known, and for OIR to make every effort to cover emergency requests for unanticipated needs. We are particularly receptive to expression of faculty needs for additional services which do not conflict with established University services. I would like to hear from you directly when you feel our service could be improved.

APPENDIX D

OIR FLOOR AREAS IN SQUARE FEET FOR THREE PHASES OF CAMPUS DEVELOPMENT

	PHASE I (9,000 students)	PHASE II (14,000 students)	PHASE III (20,000 students)
ADMINISTRATION			
Office	1555	1555	2180
Conference	190	190	270
Receiving		153	153
Total	1745	1898	2603
TELEVISION			
Office Corridor, Waiting Room, Etc.	1282	1282	1952
Video Master Control	978	978	978
Tape and Film Room	826	826	826
Studio A	794	794	794
Director's Booth A	104	104	104

APPENDIX D (CONT'D.)

	PHASE I	PHASE II	PHASE III
Studio B	1344	1138	1138
Director's Booth B	112	112	112
Future Multi-Purpose Studio	665	665	665
Tape Storage			190
Equipment Storage		1140	2500
Total	6105	7039	9259
AUDIO-VISUAL, ART, PHOTOGRAPHY			
Office, Corridor	140	548	408
Instructional Materials Preparation	884	884	2425
Set Model-Exhibit General Workshop	910	910	800

APPENDIX D (CONT'D.)

	PHASE I	PHASE II	PHASE III
AV Equipment Storage, Maintenance, Film Library	790	898	1263
Preview	190	190	360
Photographic Reproduction	402		
Negative Processing Darkrooms		192	192
Printing Room		396	396
Finishing Room		432	432
Film Loading		16	16
Photographic Studio		570	570
Dressing Room and Toilet		96	96
Photographic Laboratory			2700
Total	3316	5132	9658

APPENDIX D (CONT'D.)

	PHASE I	PHASE II	PHASE III
PROGRAMED INSTRUCTION, COURSE DEVELOPMENT, EVALUATION			
Office	405	405	2920
Instructional Laboratory	1200	1200	2000
Computer Center			1200
Total	1605	1605	6120
TOTAL	12771	15674	27640

APPENDIX E

POLICY FOR THE PURCHASE AND CONTROL OF AUDIO-VISUAL EQUIPMENT

This memorandum announces a change in policy and procedure for the purchase and control of audio-visual equipment at the University of Illinois at Chicago Circle.

Major, portable, and common items of audio-visual equipment shall be purchased for and placed on the inventory of the Office of Instructional Resources. Included in this classification are portable audio tape recorders, sound motion picture projectors, slide projectors, portable phonographs, portable public address systems, opaque projectors, wall screens, filmstrip projectors, overhead projectors, and audio-visual equipment carts. Items that may be excluded are those that are peculiar to a specific department, such as X-ray reading machines; items that are permanently installed in areas that are assigned to one department, such as tape recorders in a listening laboratory; and items costing less than $100.00, such as slide viewers.

Items of audio-visual equipment will be available to departments on a one-time short period, or regularly scheduled basis. They will also be available on a long-term assignment basis if needed for high-frequency ad hoc use.

OIR will maintain all audio-visual equipment at Chicago Circle. The cost of repairs of equipment on departmental inventory will be charged to the department.

OIR will make available student assistants to operate equipment.

Items of equipment now owned by departments may remain on departmental inventories under departmental control. If the department wishes to transfer inventory control to OIR, OIR will be responsible for equipment maintenance, furnishing lamp supply, and replacement at the appropriate time. OIR may co-ordinate and forward requests for the use of such equipment by other departments.

Loan of audio-visual equipment and student assistant services will be without charge to departments.

APPENDIX F

AUDIO-VISUAL EQUIPMENT PURCHASED FOR PHASE I (9,000 STUDENTS)

	COST	TOTAL COST
23 - Projectors (16 mm)		
13 Bell and Howell Autoloads	$ 536.00	$6,968.00
9 Bell and Howell Autoloads with still frame	569.00	5,121.00
1 Bell and Howell Magnetic Projector	720.00	720.00
8 - Filmstrip Projectors		
4 Bell and Howell 745C	160.00	640.00
4 Standard Model 1000	162.00	648.00
22 - Slide Projectors		
6 Kodak Carousel Model 570	109.00	654.00
9 Kodak Carousel Model 900	144.00	1,296.00
7 Beseler 3-1/4 x 4	270.00	1,890.00
143 - Screens		
33 70" x 70" Radiant Wall Screens	22.00	726.00
100 60" x 60" Radiant Wall Screens	15.00	1,500.00
8 Portable Radiant 70" x 70"	31.00	248.00
2 10' x 10' Portable Radiant Screens	196.00	392.00
10 - Phonographs		
6 Newcomb Model AV-10	67.00	402.00
1 Newcomb Model AVS-24	143.00	143.00
1 Newcomb Model AV-1612	118.00	118.00
1 Newcomb Model AV-164VLC	169.00	169.00
1 Newcomb Model AVS-1624V	249.00	249.00
101-- Projection Stands		
69 Wilson Stands	20.00	1,380.00
30 Bretford Stands	25.00	750.00
2 Rear Screen Movie Mover	278.00	556.00
6 - Opaque Projectors		
6 Beseler Vu-Lyte	360.00	2,160.00
22 - Tape Recorders		
19 Revere Model 3000 Tape Recorders	140.00	2,660.00
1 Wollensak Stereo	235.00	235.00

APPENDIX F (CONT'D.)

	COST	TOTAL COST
1 Magnecord Stereo	1,300.00	1,300.00
1 Tandberg Model 841F	270.00	270.00
32 - Overheads		
12 Thermofax Model 66	136.00	1,632.00
4 Beseler Master View Graph	325.00	1,300.00
2 Beseler Super Porta Scribe	203.00	406.00
12 Thermofax Model 88	141.00	1,692.00
2 Buhl Model 100	319.00	638.00
11 - Projectors (8 mm)		
1 Technicolor 8 mm Rear Screen Projector	181.00	181.00
1 Kodak 8 mm Sound	307.00	307.00
7 Technicolor Model 800	77.00	539.00
1 Kodak Super 8 Sound	398.00	398.00
1 Technicolor Model 200	170.00	170.00
6 - Cameras		
1 Nikon 35 mm Reflex Camera	445.00	445.00
1 Calumet 8 x 10	796.00	796.00
1 Bell and Howell 8 mm	199.00	199.00
1 Bolex 16 mm Model Rex 4	1,017.00	1,017.00
1 Bell and Howell Super 8 mm	205.00	205.00
1 Minolta 35 mm Camera	140.00	140.00
1 - Seal Dry Mount Press	175.00	175.00
1 - Sun Gun Portable by Sylvania	366.00	366.00
1 - Enlarger Omega Model D-2	418.00	418.00
1 - Drawing Table	108.00	108.00
1 - Honeywell Slide Reproducer	324.00	324.00
1 - Light Table 41" x 51"	325.00	325.00
1 - Technipunch	108.00	108.00
1 - Technifax Photo Printer	204.00	204.00

APPENDIX F (CONT'D.)

	COST	TOTAL COST
1 - Film Splicer for 16 mm Film	199.00	199.00
1 - Technicolor Film Loading Device	100.00	100.00
1 - Moviola 16 mm Synchronizer	166.00	166.00
1 - Film Storage Rack	152.00	152.00
1 - Moviola Editing Table	250.00	250.00
1 - Portable Public Address by Carrivoice	407.00	407.00
1 - Roving Rostrum	191.00	191.00
1 - Varityper Headliner Model 820	1,195.00	1,195.00
Fonts and Accessories for Varityper	1,040.00	1,040.00
3 - Hamilton Drafting Table 43J2	104.00	312.00
3 - Hamilton Drawer Sets 57J2 (Drawers attached to desk)	114.00	342.00
3 - Royal Chair #668-MC	26.00	78.00
1 - Leedal Stainless Steel Layout and Viewing Table Catalog #44-T with Tilt Top - Dimensions 41" x 51"	379.00	379.00
	GRAND TOTAL	$48,099.00

APPENDIX G

GENERAL WORKSHOP EQUIPMENT PURCHASED FOR PHASE I

	COST
Cut-awl Machine with Attachments	$214.50
1/2 H.P. 115 392-OSEBC Duro Motor	48.00
Tornado 400 Heavy Duty Vacuum Cleaner Model 430 Type A 1-1/4 H.P.	320.00
Attachments for Tornado 400	112.10
600 R. W. 636-35 Work Benches (Two)	118.90
600 R. W. 630-35 Work Cabinet (Two)	108.16
612 R. W. 530 Work Cabinet	121.77
640 R. W. 530-35 Work Cabinet	242.72
1072-3613 Steel Cabinets (Four)	344.40
11183 Cabinet Insets (Two)	49.28
11244 Cabinet Insets (Two)	59.04
11324 Cabinet Insets (Three)	115.62
11123 Cabinet (Three)	71.34
Installation for Work Benches and Cabinets	185.00
Miter Box and Saw	47.00
Jig Saw	39.50
Power Saw	59.58
Wood Chisel Set	31.85
RD 32 1/2 Auger Bit Set (13 Pieces)	34.80

APPENDIX G (CONT'D.)

	COST
Electric Drill	49.50
Staple Gun Kit	17.50
Wood Working Vise	25.20
Rooter H297-5 7/8 K T	173.95
Soldering Gun Kit	12.95
Sprayer Kit	60.00
Paint Brushes	35.00
Duro 3088 18" Drill Press CG3088	355.00
636-2448-R Portable Work Bench (Hollowell)	233.00
H31 Belt Sander (Stanley)	66.60
Duro R301875-Ho 10" Saw	391.57
Duro D3022966 15" Band Saw Unit	298.70
Portable Sewing Machine #92 Model Kenmore Catalog #20G25892L2	169.00
GRAND TOTAL	$4,211.53

APPENDIX H

A-V EQUIPMENT GUIDELINES FOR HIGHER EDUCATION DEVELOPED BY DAVI

	BASIC	ADVANCED
16 mm Sound Projector	1 per 12 teaching stations (Multipurpose institutions).	1 per 8 teaching stations.
	1 per 8 teaching stations (Single purpose institutions).	1 per 5 teaching stations.
8 mm Projector	1 to 3 sound projectors per institution.	1 per 10 teaching stations.
	Significant changes are occurring in the 8 mm medium which do not at present justify quantitative guidelines. Because of the important contributions of these films to individual and small group learning, however, conservative quantities have been suggested. As equipment and materials become more stabilized and as sources expand, schools should increase the quantities beyond the amounts suggested in these guidelines.	
2 x 2 Slide Projector (Automatic)	1 per 10 teaching stations	1 per 6 teaching stations.
Filmstrip of Combination Filmstrip-slide Projector	1 per 10 teaching stations.	1 per 5 teaching stations.

APPENDIX H (CONT'D.)

	BASIC	ADVANCED
Sound Filmstrip Projector	1 per 15 teaching stations.	1 per 10 teaching stations.
3-1/4 Projector (Overhead)	2 per institution.	1 per building.
3-1/4 Projector (Auditorium)	1 per auditorium.	1 per auditorium plus arc or similar power.
Filmstrip Viewer	5 to 10 at each filmstrip depository.	10 to 20 at each filmstrip depository.
	It is assumed that viewers will be available for individual use at the depositories. As this activity increases additional viewers should be secured.	
Overhead Projector 10 x 10) Classroom type	1 per 4 teaching stations.	1 per teaching station.
Overhead Projector (10 x 10) Auditorium type	Appropriate number for large group instructional areas.	

APPENDIX H (CONT'D.)

	BASIC	ADVANCED
	An auditorium model overhead merely implies that the machine utilized has sufficient light output and optical capabilities to project a satisfactory image in an auditorium type situation.	
Opague	3 to 6 per institution.	8 to 12 per institution.
TV Receivers	1 per each 24 viewers where programs available (or projection TV as needed).	1 per teaching station but no more than 24 viewers per set.
Record Players	1 per 25 teaching stations.	1 per 15 teaching stations.
Tape Recorders	1 per 5 teaching stations.	1 per 2 teaching stations.
Projection Carts	1 per 3 to 6 pieces of equipment.	1 per 2 to 4 pieces of equipment.
Light Control	Every classroom should have adequate light control. Adequate in this situation means that light can be controlled to the extent that all types of projected media can be utilized effectively.	
Videotape Recorders	1 per institution.	1 per TV production unit.
Closed-Circuit TV	1 studio per institution capable of distribution of programing to each teaching station.	

APPENDIX H (CONT'D.)

	BASIC	ADVANCED
	Many institutions may desire portable closed-circuit units for specialized use. Where this is the case, the portable units should be secured in addition to the basic recommendations noted above.	
Radio-Receivers (AM-FM)	3 available in central location.	Equivalent of 1 per classroom building.
Projection Screens	1 per teaching station (at least 70 x 70) with provision for keystone elimination plus 1 portable screen per building. Suitable screen for auditorium - large or small group use.	
Electronic Learning Lab	1 lab per institution.	As programs dictate.
Local Production Equipment	Dry Mount Press Tacking Iron Paper Cutter Transparency Production Equipment 16 mm Camera 8 mm Camera 35 mm Camera Rapid Process Camera Equipped Darkroom Spirit Duplicator Primary Typewriter	Add to Basic List: Second Type of Transparency Producer Mechanical Lettering

APPENDIX H (CONT'D.)

	BASIC	ADVANCED
Local Production Equipment (cont'd.)	Copy Camera	
	Light Box	
	Film Rewind	
	Film Splicer	
	Tape Splicer	

OE 6000 (REV. 9-66)

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
OFFICE OF EDUCATION

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PERSONAL AUTHOR(S)
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IDENTIFIERS

ABSTRACT

This report is a description of a project in which the first task was to develop the concept of a campus organization responsible for instructional resources and to develop plans for implementing it in terms of the necessary staff, space, facilities, budget, and organizational structure. An equally important concurrent task was to involve a sample of the faculty in planning for the use of instructional resources in a matter significantly related to the solution of real instructional problems.

With respect to the first task, the report describes how an Office of Instructional Resources was conceived and implemented in a developing urban university. The report details the organizational structure; the personnel, operating, and facilities budgets; the number and kind of staff required; the space required; and the equipment recommended.

Faculty involvement was brought about by the appointment of faculty committees in six important subject areas whose task it was to identify critical instructional problems in their discipline and to develop applications of instructional resources related to their solution. The chairman of each committee was released part time from other duties in order to provide the necessary leadership; consultants from about the country who could contribute to the solution of the identified problems were liberally employed; and the committees were given the opportunity to travel to other institutions in order to observe and to discuss examples of significant innovations in their instructional areas.

The work of these committees is reported in considerable detail and their accomplishments are discussed.